Emotional Strain And education in the social field

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Abstract:

This paper addresses the challenge of conveying emotionally challenging topics in online adult education in the social field, and seeks to answer two key questions: 1) What are the main research themes concerning the relationship between adult education and emotions? 2) What implications for online-interventions can be drawn from this research to help learners manage emotional strain arising from emotionally challenging topics? Systematic and non-systematic literature searches were conducted to identify the main themes concerning emotions and education. Based on these, the paper proposes data-based interventions for emotional distress in online courses, such as providing brief emotion regulation instructions, emotional training and communication opportunities while considering learner autonomy. The paper therefore extends the discussion on learning and emotions and may aid to further investigate the management of topic-induced negative emotions in online learning environments.

Keywords: further education, emotion, emotion regulation, intervention, social field

I. INTRODUCTION

In the age of communication technology, e-learning plays an important role from primary education onwards. It offers various learning settings: asynchronous or synchronous, individual or group. This is true also for social work qualifications, where e-learning is used as a learning tool both in higher education modules and in continuing vocational training [Madoc-Jones and Parrott.; 2005; Racovita-Szilagyi et al., 2018; Bressem et al., 2016]. Social work, and the social sector in general, is an emotionally demanding field. It involves continuous exposure to difficult life situations which challenge the clients, combined with the role expectations of this profession. These factors may lead to exhaustion, alienation, and may eventually result in burnout, if not regulated [Elsässer and Sauer, 2013; Nüsken, 2020]. On the other hand, functional emotion regulation strategies, awareness and a change of perspective to see positive effects of difficult situations, can help social workers to handle their emotions and prevent burnout [Collins, 2007; Wendt et al., 2011a; Wendt et al., 2011b; Bogo et al., 2017; Morrison, 2007]. Emotional stress can be triggered by the learning environment itself. This may be due to isolation resulting from the physical and temporal separation of the learner from the tutor [Crouch and Montecino; 1997], but also as a result of collaboration in an online environment [Allan and Lawless; 2003]. However, studies discussing e-learning in context of social work education investigate primarily the didactic and pedagogical aspects of these programs and the success of conveying knowledge. Recent studies discuss challenges of e-learning in this field, but they focus rather on the teaching aspects, such as ethical issues [Reamer, 2013] or the development of an effective teaching presence [Davis et al., 2019]. They do not address the emotional state of the learners which may be affected by the contents of the learning materials which can lead to a dysfunctional strain and thus to an impairment of the learning process. To avoid dysfunctional emotional strains, learners in an online setting should be helped to regulate their emotions, which can usually be done with the help of an instructor in face-to-face environments. According to Dinkelaker [2021], visual access to the faces of the other participants in online video conferences (if they activate their cameras) does not necessarily provide the same opportunities for non-verbal communication as in-person events. Even if all participants are visible on the screen and they, in turn, have their gazes fixed on the screen, the participants cannot have direct eye contact. We can tell whether attendees are looking at their screen or not, but we cannot

discern what exactly they have their attention on. Consequently, it is not possible to comprehend the learners' perception and learning process to the same extent [ibid.]. Furthermore, our ability to empathize is impeded by the absence of perception of participants' facial expressions and gestures. Effective communication requires the reception of (facial) feedback from the other party. However, in the digital space, we are unable to assess, for instance, whether a smile is directed toward a certain person or whether the participants are still engaged [Susman, 2022, p. 8]. This lack of empathy poses a problem as it may result in unobserved emotional distress. This issue exacerbates further when dealing with asynchronous digital learning settings. Therefore, the goal of this paper is to serve as step toward developing a framework which enables digital vocational education in the social sector by proposing appropriate interventions, i.e., a bundle of recommendations and impulses for the learners, to help them overcome or prevent dysfunctional emotional strain that otherwise would negatively influence the learning process. The objective of this paper is to answer following questions:

- What are the main themes in research concerned with the relationship of adult education and emotions?

- What implications for online-interventions can be drawn from the existing literature to help the learners to reduce emotional strain arising from sensitive topics and restore a functional learning-state?

To answer these questions, existing literature has been reviewed. The paper is structured as follows: First, we present two major theories concerning emotions in relation to learning and emotion regulation (II), then we describe the literature search, categorization and analysis procedure (III). We then review the main themes of the literature found (IV), namely: intervention studies aimed at reducing negative emotions in educational settings, particularly those arising from stress and anxiety, the main components and effectiveness of stress management and mindfulness programs, the importance of communication when confronted with negative emotions, and research on the effectiveness of emotion regulation strategies outside of educational settings. The findings are then discussed and implications for the design of the future interventions are outlined The proposed interventions include data-based recommendations, such as providing brief emotion regulation instructions, emotional training and communication opportunities while considering learner autonomy (V). Finally, the results are summarized and conclusions for further research are presented (VI).

II. THEORY

There are two main theories on which most studies of the relationship between emotions and learning and emotion regulation are based on. These two theories – the Control-Value Theory of Achievement Emotions and the Process Model of Emotion Regulation – are presented in this section, to provide a better understanding of the relationship between learning and emotions and of how and why emotions can arise as well as how they can be influenced.

The Control Value Theory of Achievement Emotions developed by Pekrun provides a framework for the effects and causes of emotions in academic settings. It focuses on achievement emotions, which are defined as "emotions tied directly to achievement activities or achievement outcomes" [Pekrun, 2006, p. 317]. The theory includes emotions such as enjoyment, anger, frustration and boredom that are directly related to learning activities as well as "outcome emotions" such as joy, pride, anxiety, hopelessness, shame, and anger which are related to (expected) success or failure [ibid, p. 320]. It provides implications for educational interventions to influence learners' emotions, in particular, to reduce negative emotions like boredom, shame, anger and hopelessness and foster positive emotions like hope, pride and enjoyment of learning [ibid: pp. 327-329, pp. 333-337]. For instance, the author describes attributional retraining as a way to change the students' emotions. The idea is that achievement emotions arise from judgements of learner's competence or perceived control to master a learning task or to be successful. It may also arise from the attributed relevance of the learning activity, which can be intrinsic, like perceiving the learning content as valuable, or extrinsic, such as getting a good grade [ibid, p. 336]. Therefore, getting learners to see the value
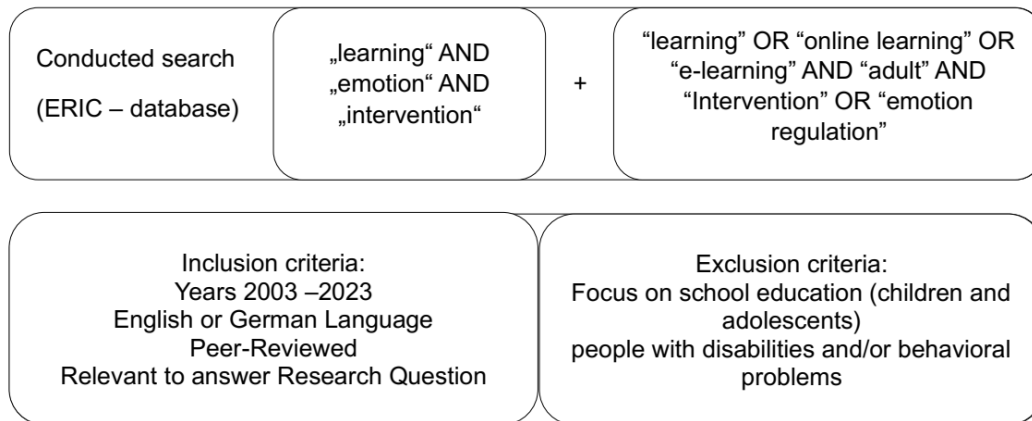
of the learning content can help them to regulate their emotions and improve their learning. However, by focusing solely on achievement emotions, only a limited range of possible emotional responses is taken into account. Pekrun [2018] also identifies other factors that trigger emotions in the learning process. Emotions therefore may be not only achievement-related (e.g., fear of failure) but also epistemic (e.g., confusion), social (e.g., sympathy for my fellow learner), technology-related (e.g., frustration due to a poor internet connection), or topic-related (e.g., dealing with child poverty). These topic-related emotions can be especially relevant to courses in the social field, but they are not deemed significant beyond their mere mention.

To find a way to help learners cope with topic-related emotions, it is necessary to first consider the regulation of emotions. According to Gross' Process Model of Emotion Regulation, emotions trigger a "coordinated set of behavioral, experiential, and physiological response tendencies that together influence how we respond to perceived challenges and opportunities" [Gross, 2002, p. 281]. How individuals attempt to influence their emotions per se as well as their responses to them, depends on the emotion regulation strategies they employ [Gross, 1998, pp. 281-282]. Gross distinguishes five strategies, which primarily differ in their effect on the emotion-generative process: situation-selection (e.g. decide to skip class), situation-modification (e.g. not talk about a certain topic), attentional deployment (e.g. focusing on something else), and cognitive change (e.g. seeing the benefits of a difficult situation) belong to the group of antecedent strategies – i.e., they operate before the emotional response is fully activated. Whereas response-modulation (e.g., suppressing of feelings) is considered as response-focused strategy, which is used when an emotion is already induced [Gross, 1998, pp. 281-285; Gross, 2002, p. 283]. In real-life situations, usually more than one strategy is applied simultaneously. Gross points out, that while there is increasing interest in researching the application of emotion regulation strategies to different situations, it is still unclear under what circumstances which strategies are effective [Gross, 2015, pp. 15-16].
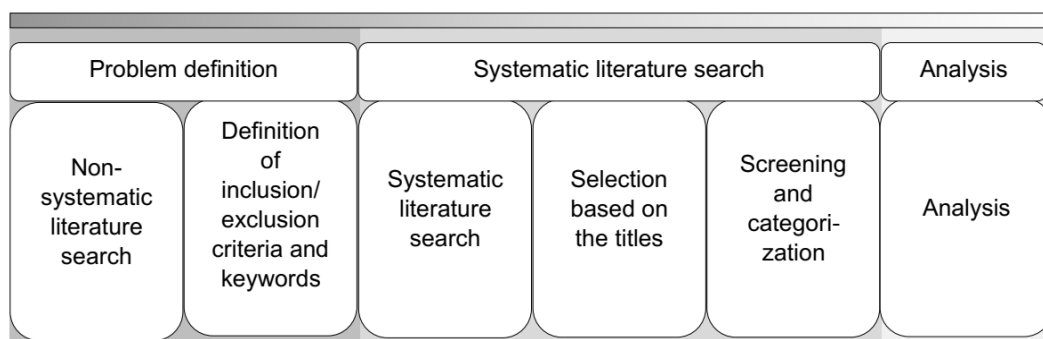
III. METHOD

To answer the research questions, we first performed a non-systematic literature review primarily using educational and psychological databases. After that, we conducted a forward-search for empirically tested interventions, to find indications on how to help learners who experience emotional strain in a learning setting. As the ongoing search revealed a lack of research on this topic, a systematic literature search using Cooper's taxonomy followed [Cooper, 1988]. To find relevant literature, we defined inclusion and exclusion criteria, based on the knowledge gained from the previous non-systematic search. The focus was on peer-reviewed publications in English and German language of the years 2003 - 2023. There were no restrictions concerning a specific research methodology, geographical region or set of journals. Due to the lack of literature on interventions for adults in learning settings who experience emotional distress induced by sensitive course-topics, the search concentrated on publications that examined the relationship between emotion and adult learning. The defined keywords addressed this relationship. They included: "learning", "online learning", "e-learning", "adult", "emotion", "intervention" and "emotion regulation". We conducted the search on the "ERIC" - (Education Resources Information Center) database. It resulted in 1069 hits, which were sorted out in the first round based on their titles. Literature concerned with education often focuses on school education and therefore on children and adolescents as learners. We excluded this kind of literature as it does not address adults. The same goes for papers focusing on individuals with disabilities and behavioral problems. Although the research interest focuses on vocational training, we included publications with university students as participants in the analysis due to the limited literature on this topic. Information on how we conducted the search and the inclusion as well as exclusion criteria are presented in Figure 1.

Figure 1: Conducted Search and Selection Criteria

Conducted search (ERIC – database)	„learning" AND „emotion" AND „intervention"	+	"learning" OR "online learning" OR "e-learning" AND "adult" AND "Intervention" OR "emotion regulation"

Inclusion criteria: Years 2003 –2023 English or German Language Peer-Reviewed Relevant to answer Research Question	Exclusion criteria: Focus on school education (children and adolescents) people with disabilities and/or behavioral problems

In total, we screened the abstracts of 86 publications, together with 42 publications from the previous, non-systematic search. Next, we once more screened the whole content of the remaining 27 publications for their relevance to answer the research question. Finally, we analyzed and categorized the remaining 21 papers in order to examine the main themes concerning the relationship of adult education and emotions and draw implications for possible e-learning interventions. Following the approach suggested by Webster and Watson [2002], we developed a matrix to organize our readings. The matrix comprises information on the sample, the emotions under consideration classified as negative or positive, as well as achievement or non-achievement emotions [Pekrun 2006, 2018], the type and purpose of intervention as well as the research method used. We then synthesized and analyzed the key themes that were identified. The methodological procedure is depicted in Figure 2.

Figure 2: Methodological approach

Problem definition		Systematic literature search			Analysis
Non-systematic literature search	Definition of inclusion/ exclusion criteria and keywords	Systematic literature search	Selection based on the titles	Screening and categori-zation	Analysis

IV. DATA ANALYSIS

Despite an intensive search, we found no literature on (short-time) interventions in online learning settings for adults after exposure to sensitive topics that can trigger strong emotions. The relevance of designing such an intervention is particularly relevant for courses related to social issues. Studies confirmed that negative emotions can impact self-perceived competencies [Rodriguez et al., 2014] and performance [Jarrell et al., 2017], whereas positive emotions can enhance motivation and learning [Ramsay and Holyoke, 2013]. Of the 21 papers identified as relevant, six had adults as the target group, twelve papers were aimed at university students, and three publications did not specify a target group. Furthermore, most publications focused on achievement emotions (N = 9) rather than emotions arising from emotionally challenging topics. We also included literature that is not related to educational settings to provide reviews of interventions targeting emotional distress (N = 4). The other literature focuses on (non-academic) stress (N = 2) and other emotions (N = 6) like grief [Döveling and Wasgien, 2013], or does not specify which emotions it examines [e.g. Jiang and Koo, 2020].

After screening and categorizing the remaining literature, we found four main groups. These include (1) intervention studies in educational settings, (2) stress management and mindfulness programs, (3) the role of communication and (4) emotion regulation strategies.

Emotion regulation and Education

Studies in the first category examined different interventions to foster positive emotions for enhanced learning. None of the studies employed emotionally challenging topics to measure the learning outcome, but all of them targeted the relationship between emotions and education. For instance, Engelmann and Bannert [2019] used material on probability theory to measure the participants' learning outcome with a subsequent knowledge test, while D'Mello et al.'s [2010] study involved computer literacy classes for the participants. Engelmann and Bannert [2019] and Quay and Quay [2018] examined the effects of brief trainings on emotion regulation. Even though, neither found significant improvements in learning outcomes, participants reported reductions in negative feelings like anxiety and stress. On the other hand, there are studies confirming the impact of attributional styles and attributional retraining as a means of regulating one's emotions [D'Mello et al, 2010; Hall et al., 2007; Kumschick et al., 2021]. However, given the differences in methodology and intervention implementation, it cannot be stated with definite certainty that these results indicate the superiority of attributional retraining for emotional regulation in educational settings. Some of the studies utilized videos as an intervention [Engelmann and Bannert, 2019; Quay and Quay, 2018; Kumschick et al., 2021]. For example, in the study conducted by Kumschick et al. [2021], participants viewed a video depicting a classroom disruption. The experimental group additionally watched a video featuring the disruptive student's reflection on his actions, while the control group did not watch this reflection [Kumschick et al., 2021]. Then again, D'Mello et al. [2010] examined the effect of a dialogue-based intelligent tutoring system (ITS) on the participants' attributional styles and learning outcomes. The tutoring system responded to negative emotions such as boredom, confusion and frustration experienced by learners during the course. It then provided motivational responses, by attributing negative affects to the learning process itself or the learning material rather than to the learners.

Moreover, examinations of attributional styles also differ in their underlying assumptions, resulting in variations of their instructions and responses to the learners. Hall et al. [2007] instructed the learners to complete an affective writing task that entailed reflecting on an unsuccessful exam or assignment and its emotional impact on them. They posited that the effect of reattribution would emerge "by encouraging students to construct a coherent emotion-based narrative" [ibid., p. 281]. This would lead to an incorporation of negative experiences "into an organized linguistic structure, allowing the memory to be understood and forgotten more efficiently" [ibid.]. As a result, the authors expected that the negative experiences would be prevented from impeding learning processes. On the other hand, D'Mello et al.'s ITS aimed to "keep students engaged, boost self-confidence, heighten interest" [D'Mello et al., 2010, p. 246] to enhance learning outcomes. Furthermore, significant effects were observed in low-elaborating students, while high-elaborating students were not impacted by the affect-oriented interventions [D' Mello et al., 2010; Hall et al., 2007]. It also remains unclear whether this type of intervention would prove effective for emotionally challenging learning content since the studies are solely focusing on achievement emotions. Engelmann and Bannert [2019] as well as Quay and Quay [2018] suggest that the lack of impact of their interventions (cognitive reappraisal and mindfulness trainings) may be due to the short duration of the theoretical input and practice phase, which did not provide ample opportunity for students to learn how to appropriately apply the learned strategies. According to the authors, to effectively use emotion regulation strategies, more practicing time is needed. In summary, there are no answers yet, to the questions what emotion regulation strategies (i.e. cognitive reappraisal, reattribution, mindfulness trainings) are best suited and how they should be implemented (i.e. theoretical input and practice phase or continuing impulses throughout the course) for helping individuals to regulate their emotions in education.

Stress management programs

Another main topic of the identified papers involves training for managing stress and anxiety through mindfulness and/or emotion regulation. The literature shows how to design effective

training programs for learners to functionally regulate their emotions and mitigate negative emotions [Fidler, 2004; Lehr et al., 2014]. It also outlines the main components and requirements necessary for successful stress management programs. These programs usually cover strategies such as cognitive reappraisal, reattributions, perspective changes, relaxation techniques or psycho hygiene and typically consist of theoretical inputs on stress emergence and its consequences, as well as self-evaluations of the stress level. Often, after the theoretical input, a practical part is also included [Fidler, 2004; Lehr et al., 2014, Engelmann and Bannert, 2019; Quay and Quay, 2018]. Regarding the requirements for the success of such programs, the literature highlights the importance of granting the learners autonomy in the learning process to avoid drop-outs. Furthermore, long-term objectives should be implemented, as the acquisition of emotion regulation skills and the alteration of attributional styles require long training-phases [Fidler, 2004; Lehr et al., 2014] as previous studies showed [Engelmann and Bannert 2019; Quay and Quay, 2018]. Group training sessions are recommended to ensure that various perspectives are considered in finding solutions for handling stressful situations. The included literature also emphasizes the importance of regular participation and that participants shall not be in any acute stress which requires therapeutic measures [Fidler, 2004; Lehr et al., 2014]. Lehr et al. [2014] analyzed the particular requirements and challenges of online stress management programs. According to the authors, these programs often consist of short videos or audio recordings conveying information about stress management. Additionally online journals are used to monitor one's own health status and its' progress. They summarize that studies indicate the effectiveness of online programs for decreasing negative emotions like anxiety and depression [Lehr et al. 2014]. Nevertheless, they also note that keeping track of one's own emotions and document the progress in a journal may be labor intensive and requires advanced literacy skills. Also, in an acute emotional crisis, it is not feasible to offer immediate support via online programs.

Communication

Another central topic in online adult education is communication. Qualitative, exploratory studies have been conducted to examine this issue [Pastogianni and Koutsoukos, 2018; Zembylas et al., 2008; Jiang and Koo, 2020; Ch'ng, 2019]. In these studies, emotions are not predefined by the researcher, but rather described by the adult participants of (online) courses. This includes, among others, analyzed interviews, online journals, online and face-to-face group discussions, and e-mails. With the exception of one study [Pastogianni and Koutsoukos, 2018], all included studies related to this topic have been conducted in an e-learning environment. Most of the emotions described by the participants can be classified as achievement emotions, as they relate to (expected) results, difficulties in learning or the tasks, or demands of the courses [Pastogianni and Koutsoukos, 2018; Zembylas et al., 2008; Jiang and Koo, 2020; Ch'ng, 2019]. Nonetheless, it is noticeable that non-achievement emotions are mainly associated to interactions with other individuals. For instance, some studies discuss negative perceptions about the authenticity of online communication [Zembylas et al., 2008; Jiang and Koo, 2020] whereas others note that students wished emotional support and fostering of positive communication in the classroom from their instructors. The learners also wished their instructors to be encouraging, empathetic and emotionally intelligent, [Pastogianni and Koutsoukos, 2018]. On the other hand, positive sentiments were reported as result of a positive class atmosphere [Pastogianni and Koutsoukos, 2018], peer interactions and discussions [Jiang and Koo, 2020; Ch'ng, 2019; Zembylas et al., 2008] as well as easy communication or a strong rapport with the instructor [Jiang and Koo, 2020; Zembylas et al., 2008]. Furthermore, in Zembylas et al. [2008] the participants were required to record their emotions in a journal, which they found to be valuable, but acknowledged that it cannot substitute communication with others. Considering the significance of communication in online courses, Jiang and Koo [2020] propose the inclusion of additional communication components as the upload of personal pictures or a welcoming video by the instructor to facilitate relationship building.

Emotion regulation (not specified context)

Finally, there are studies on emotion regulation that are not stemming from educational research. Following Gross' Process Model of Emotion Regulation, many studies examine the effectiveness of interventions by instructing participants to regulate upcoming emotions in an experimental setting. Webb et al. [2012] conducted a systematic literature review and identified 306 studies

comparing emotion regulation strategies. The results of the review indicate that cognitive change is the most effective strategy. They also show that emotion regulation generally tends to be more effective in increasing positive feelings rather than decreasing negative ones. Furthermore, the impact of these strategies may vary depending on the experienced emotions. For instance, it is comparatively easier to regulate emotions induced by pictures or videos of other people than emotions elicited by personally relevant stimuli, as failure feedback or negative personal experiences [Webb et al., 2012, p. 781]. It is also important to note that most studies reviewed by Webb et al. [2012] mainly were not related to learning settings.

The studies considered in our paper also use pictures or videos to elicit negative emotions [Hayes et al., 2010; Kremer et al., 2023; Wolgast et al., 2011]. Therefore, it remains unclear whether emotions emerging in a real-life situation or stemming from emotionally distressing learning subjects, such as the confrontation with traumatizing experiences of potential clients, may be stronger and thus more challenging to regulate. On the other hand, a case study, investigating the effects of a digital mindfulness training, showed favorable impact on the well-being of a patient diagnosed with borderline personality disorder who prior experienced heavy negative self-referential emotions [Nararro-Haro et al., 2016]. But these positive effects required extended periods of training. It should also be noted that this finding cannot be generalized, as the study concentrates on the experiences of a single individual [ibid.]. The emotion regulation interventions in the analyzed studies, with exception of the case study, comprise of short written instructions for the participants to view the emotion-inducing material from a specific perspective. All of them are focusing on the effects of cognitive reappraisal as a regulating strategy [Hayes et al., 2010; Kremer et al., 2023; Wolgast et al., 2011], comparing it with either suppression [cf. Hayes et al., 2010], acceptance [c.f. Wolgast et al., 2011] or no instruction for the regulation of emotions. While the studies demonstrate the effectiveness of cognitive reappraisal, it must be noted that they were conducted in experimental settings that involved participants being instructed on emotion regulation before experiencing the induced emotions [Hayes et al., 2010; Wolgast et al., 2011]. That is presumably, because accordingly to Gross' Model the studied emotion regulation strategies are perceived as antecedent regulation strategies. Unlike in experimental settings, in real educational settings it is difficult to predict when negative emotions may arise during the course. Therefore, interventions in e-learning must be implemented after they have been detected respectively reported thus after emotions have already arisen.

V. IMPLICATIONS FOR E-LEARNING INTERVENTIONS

To answer the second question, how to design e-learning interventions to reduce emotional strain, we discuss the implications of the results presented above. Firstly, the learners' emotions should be continually measured to propose timely interventions to avoid detrimental effects [D'Mello et al., 2010]. There are numerous possibilities to measure emotions in e-learning, as can be seen for example in Engelmann and Bannert [2019, pp. 8-9], D'Mello et al. [2010, p. 247], Engelmann [2019, pp. 72-82] or Reinmann et al. [2006].

Short instructions on emotion regulation

Concerning the design of potential interventions, several studies provide evidence for the effectiveness of short training sessions or impulses in regulating emotions. This particularly pertains to studies investigating the effects of attributional retraining [Hall et al., 2007, D'Mello et al., 2010]. In contrast, other studies suggest that utilizing emotion regulation strategies effectively requires time and practice [Lehr et al., 2014,; Engelmann and Bannert, 2019; Fidler, 2004, Quay and Quay, 2018]. Despite that none of the studies address sensitive topics commonly taught in social sector learning programs, these findings are still valuable. Regarding individual differences in the effectivity of different emotion regulation strategies [Webb et al., 2012; D'Mello et al., 2010; Hall et al., 2007] a bundle of different strategies should be provided in online courses. The literature suggests different short-time interventions to aid distressed learners: some interventions may enhance motivation via impulses [D'Mello et al., 2010], while others involve presenting an alternative perspective [Kumschick et al., 2021] or short instructions for emotion regulation strategies such as cognitive reappraisal [Kremer, 2023]. Cognitive reappraisal appeared to be

especially effective at regulating one's emotions [Webb et al., 2012, Wolgast et al., 2011, Kremer et al., 2023, Nararro-Haro et al., 2016], and also demonstrated positive outcomes as strategy used in digital device assisted training [Nararro-Haro et al., 2016; Lehr et al., 2014]. An exemplary intervention instructing the learners to apply cognitive reappraisal could be, e. g. to identify the potential professional development benefits of the learning content.

Additional information and practice opportunities

Training programs designed to reduce stress and anxiety [Engelmann and Bannert, 2019; Quay and Quay 2018] show positive effects in terms of reducing negative emotions and increasing overall well-being. However, no effect on learning outcomes has been confirmed, presumably due to their brevity. Regarding the goal of providing immediate assistance to restore a functional learning state, short trainings sessions (20 min vs. 90 min) are already too time-intensive and require too much cognitive capacity. These sessions may not be effective in helping individuals in dysfunctional states but are still useful as a preventive measure or subsequent offer for learners interested in acquiring emotional skills. The interventions in online learning therefore should be based on the learners' emotional state. Short content-related impulses or instructions for emotion regulation strategies should be provided if emotional strain is detected. If the strain is successfully reduced, the learners' can be offered the possibility to get additional information on the emergence of negative emotions, the benefits of emotion regulation strategies, self-assessment of stress levels, attributions and practical exercises for enhanced learning. These resources should be suggested to individuals seeking to acquire and develop emotional competencies but not learners who experience acute emotional strain. Also, external emergency hotlines should be implemented for learners in need of professional help. This concerns individuals experiencing an acute existential crisis.

Opportunities and impulses for online communication

Results and reflections from the proposed training may be (voluntarily) discussed in groups, with learning buddies or the instructor. The literature focusing on stress management training suggests that group sessions are more effective due to the benefit of group dynamics [Lehr et al., 2014, Fidler, 2004]. Accordingly, other studies [Pastogianni and Koutsoukos, 2018; Jiang and Koo, 2020; Ch'ng, 2019; Zembylas, 2008], emphasize the significance of communication in both online and offline courses to enhance positive emotions. They posit that learners require quality communication with their peers and instructors. Although it appears to be challenging to replicate real-time group discussions in asynchronous learning, different channels for online communication can be implemented, since there are various options for synchronous and asynchronous online-communication. To overcome thresholds in using online communication tools, rules of conversation (e.g. being polite and respectful) should be established and their usage promoted through interventions if emotional strain is identified. Regarding the appropriateness of communication tools, it remains the responsibility of the research community to determine which form is suitable for discussing emotionally challenging subjects. Promising results can be reported, for instance by Döveling and Wasgien [2013], who found through their examination of grief forums that discussing sensitive topics in online forums is feasible. Besides forums, emotionally strained learners could also be prompted to contact either the instructor or another learner privately, if they do not feel comfortable with sharing their emotions with a group. Moreover, participants in online-environments found it crucial to establish a good rapport with their instructors and have their support readily available. To facilitate this, instructors should provide their students with friendly pictures and welcome messages as well as online office-hours and feedbacks, as recommended by Jiang and Koo [2020].

In addition, a variety of possible interventions installed to help learners to manage their emotions immediately without requiring interaction with other individuals, can still be discussed in a group afterwards.

Automatically generated emotion graph

Furthermore, the measured emotions can be shown to the individual as a graph depicting the various emotions they have reported throughout the course. By that, the learner can track changes

of her or his emotional state, preferably concerning the learning content and applied interventions. This graph can provide an alternative to writing emotion journals, which require a high level of literacy as has been criticized by Lehr et al. [2014]. The instructor could then get an overview of the (anonymous) emotions of all learners in relation to the learning content instead of written emotion journals. Thus, the instructor will be able to identify emotionally challenging topics and discuss them (in synchronous sessions) or adapt the learning material.

Autonomy

Lastly, it is important to offer help only when needed and grant autonomy to learners in selecting the proposed interventions. As D'Mello et al. [2010] showed, emotional support should not be provided, unless it is required. Therefore, interventions should be offered voluntarily to avoid irritations or detrimental effects.

Recommendation System

Overall, it remains nonconclusive which emotion regulation strategy is most appropriate for the individual experiencing emotional distress in online learning. For some, it may be more effective to receive repeated short impulses that encourage the application of emotion regulation strategies (e. g. attributional retraining or cognitive reappraisal) throughout the course of an education program. For others it may be more effective to acquire different techniques through workshops or training programs. According to Gross' Model, emotion regulation strategies differ in their effectiveness depending on the timing of the intervention in the emotion generation process as well as the situation [Gross, 1998, 2003]. But he also suggests that individuals actually use a combination of strategies to regulate their emotions. Meaning, that in real situations the process of regulating one's emotions is more complex [Gross, 2015, p. 211]. Furthermore, there are interindividual differences in the effectiveness of different interventions [Webb et al., 2012; D'Mello et al., 2010; Hall et al., 2007]. To approach this problem, knowledge for a recommendation system could be compiled through continuous monitoring of (self-reported) emotional states and recording data on the interventions used throughout the course. As a result, the most suitable intervention to support emotional distress both generally and for the individual learners would be provided. Finally, the recorded data may offer further insight into the relationship between emotion regulation and adult online learning. A proposal of how a concept for e-learning interventions can look like, is depicted in Figure 3.

Figure 3: Proposal for e-learning intervention concept
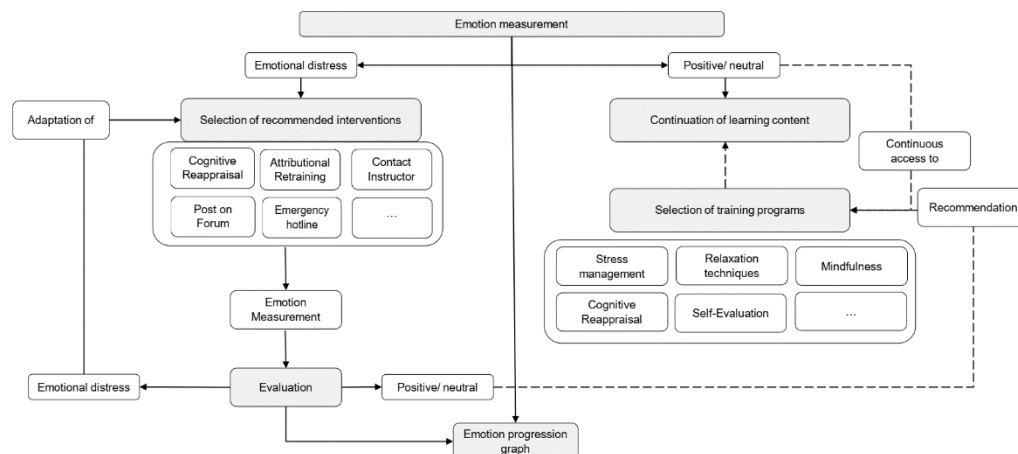
The process begins by gauging emotions, as illustrated at the top of Figure 3, If positive or neutral emotions have been assessed (right side of the illustration), the course may proceed, with the choice to use the provided interventions at any moment. For positive or neutral states, long-term training programs are suggested to foster emotional competencies, as indicated by the dashed line. When a negative emotional strain that may hinder the learning process is detected, learners are

presented with a selection of short-term interventions to offer immediate aid (left side of the illustration). Learners always have the option to execute an intervention or not. Once an intervention is carried out, the emotional state is measured again to determine whether the intervention has had the desired effect of improving the emotional state. If the intervention proves effective, the course can progress. Additionally, a recommendation is made to strengthen emotional competencies through the available training programs.

In case negative, dysfunctional emotional state persists after the intervention, further interventions should be proposed to alleviate or diminish the intensity of the emotions. Assessment of post-intervention measures can ascertain the effectiveness of interventions for the individual and allow adjustments of intervention recommendations accordingly. Furthermore, gathering measurement results from all learners enables the analysis of the overall effectiveness of the intervention. These data can be used to tailor interventions for individual courses and to advance research by demonstrating which interventions yield the desired effect. Finally, the measured emotional states for individuals are depicted in a graph as shown at the bottom of the illustration, providing an overview of their emotional states throughout the course. This serves as a tool to help individuals better understand and categorize their own emotions.

VI. CONCLUSION

Summary

Based on the foregoing digitalization of education, this paper focuses on the unique challenges of vocational education in the social sector, as the learning content in this field can include emotionally challenging and complex topics. Firstly, Pekrun's Theory was presented, which states that negative emotions can impede the learning process, was depicted. This emphasizes the necessity to develop a concept for preventing negative emotions in the digital environment to enhance the well-being and learning outcomes of the participants. Following that, another prominent theory concerning emotions was outlined, namely the Process Model of Emotion Regulation, for further comprehension of how emotions can be regulated to improve the learning process. The study then proceeded to present the findings of a non-systematic and systematic literature search. The objective of this paper was to review the existing literature on handling of emotional strain in adult education and suggest effective interventions in e-learning settings to prevent dysfunctional states caused by the exposure to emotionally distressing topics. The literature review revealed a notable gap in research on this area. This paper therefore highlights the need for both qualitative and quantitative research to bridge this gap. Most of the reviewed studies focus on achievement emotions. Negative emotions such as anxiety, stress and hopelessness have been hence examined in relation to issues as exams and expected learning outcomes rather than to emotionally challenging content within the learning materials. Research on emotion regulation based on the Process Model of Emotion Regulation is mostly not related to learning settings and often evoke emotions in the participants through pictures and video after they have been instructed how to regulate their emotions. They focus on emotions like fear, anxiety and disgust and also do not consider the emergence of emotions from sensitive topics such as dealing with trauma, injustices and difficult life situations in the social sector. Nevertheless, implications for interventions targeting emotional strain have been drawn. These consist of 1) short, repeatedly available instructions for emotion regulation, 2) additional information and exercises to practice emotion regulation strategies, 3) opportunities for online communication and giving impulses to get in touch with each other when experiencing emotional distress 4) an automatically generated overview of the emotions experienced throughout the course, 5) granting autonomy by letting the learners decide for themselves whether they need an intervention, and 6) suggesting interventions based on collected data about emotions and interventions used (while still always offering more than one option).

Future Research

The proposed framework is based on existing literature recommending interventions for adult online learning in the social sector, however, further research is necessary to determine its efficacy. Nevertheless, this paper launches a discussion on topic-induced emotions in online learning

environments, thereby expanding the discourse on the relationship between learning and emotions. The findings of this work can be enhanced to facilitate digital education for emotionally distressing content. This would allow, for example, the conversion of courses in the social field into digital formats without leaving learners to manage with emotional distress on their own. Thus, learners in the social field could also benefit from online learning, through its inherent advantages such as scheduling flexibility and location independence.

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LIST OF REFERENCES

Editor's Note: The following reference list contains hyperlinks to World Wide Web pages. Readers who have the ability to access the Web directly from their word processor or are reading the paper on the Web, can gain direct access to these linked references. Readers are warned, however, that
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