

LEARNING STYLES, TECHNOSTRESS & BLENDED LEARNING – IMPLICATIONS FOR THE EDUCATIONAL MODEL OF THE FUTURE

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Abstract

Although the blended learning teaching format has been existing for several years, the COVID-19 pandemic has shown us once again how important digitization is in the education industry. The aim of this study is therefore to find out what opportunities and risks blended learning has as a teaching format from the perspective of students with the learning style "pragmatist" and to what extent technostress will be relevant in this context. A qualitative study was conducted in which 11 undergraduate students with the learning style "pragmatist" were asked about their personal experience and opinion regarding the three teaching formats face-to-face, distance and blended learning in order to find out the individual advantages and disadvantages. The results have shown that blended learning is suitable as a teaching model from the students' perspective. However, attention must be paid to good organization and communication in order to be able to take advantage of both teaching formats, namely face-to-face and distance learning. The effects of technostress could not be determined after the COVID-19 pandemic as an external influencing factor strongly affected the students' perceptions of distance learning.

Keywords: *COVID-19 pandemic, learning styles, face-to-face learning, distance learning, blended learning, technostress.*

1. Introduction

Due to the rapid spread and severity of the 2019 coronavirus disease, also known as COVID-19, the situation was globally classified as a pandemic on March 11, 2020, by WHO Director-General (World Health Organization, 2020). In response, governments have enacted various restriction measures to prevent further contagion (Saidi, Sharip, Abd Rahim, Zulkifli, & Md Zain, 2021).

After educational institutions had to be closed in the course of social restrictions, these institutions were forced to switch from face-to-face classes to the online format immediately and indefinitely (Saidi et al., 2021). Despite the many benefits of distance learning (Sadeghi, 2019) that have allowed academic education to continue during the COVID-19 pandemic, it also came with some limitations and it cannot generally be said that this format will replace traditional face-to-face instruction in the future (Sadeghi, 2019). Therefore, the question arises whether a mixture of both educational models (blended learning) would be the ideal solution for the future of education. This could combine the benefits of face-to-face and distance learning (Harding, A., Kaczynski, D., & Wood, L., 2005).

In this context, care must be taken to ensure that the teaching/learning processes to be used ensure that the information is received and processed by the learner as efficiently as possible (Costa, Souza, Valentim, & Castro, 2020). Scholars such as Kolb (1984) and Mumford and Honey (1992) have recognized this necessity early on and have focused their research on determining different learning styles to assist educators in developing teaching/learning methodologies.

In this regard, technological progress also plays an important role, which should not only enable greater access to knowledge, but also provide better learning and teaching (Tuapawa, 2017) – but this also comes with bad effects as well. One of these effects is the so-called technostress, which was first used by Brod (1984). Currently, there is a dearth on studies on whether and to what extent technostress matters in the context of academic education (Upadhyaya & Vrinda, 2021). One of these studies was conducted by the authors Upadhyaya & Vrinda, 2021, whose findings revealed that even tech-savvy students suffer from moderate levels of technostress, which in turn negatively affects the students' performance.

Consequently, the aim of the study at hand is to answer the question: "what opportunities and risks arise with regard to the blended learning format from the students' perspective with the learning style "pragmatist" and what significance can be attributed to technostress in this context?"

2. Theoretical background

For the study at hand, the educational model of blended learning, various learning style models, and the phenomenon of technostress were examined.

2.1. Blended learning

Blended learning combines traditional and digital teaching methods for knowledge transfer with the aim of achieving an improvement of the learning outcomes for the students (Singh, H., & Reed, C., 2001). Face-to-face learning complies to the traditional teaching method (Titthasiri, 2013). Knowledge transfer takes place within the physical presence of students and teachers in an educational institution, especially in a classroom with blackboards, whiteboards, books, projectors, etc. (Titthasiri, 2013). This form of teaching is considered teacher-centered because the teacher sets the structure of the lesson, including breaks and classroom discussions (Rashty, 2003; Titthasiri, 2013). The course material is elaborated with the participation of the entire class (Rashty, 2003; Titthasiri, 2013).

In contrast, distance learning provides access to education for geographically dispersed students, i.e., through the use of electronic devices, students can participate in classes, course materials are provided to them, and contact between students and instructors is also established through its use (Sadeghi, 2019). The U. S. Department of Educational Research and Improvement defines Distance Learning as „the application of telecommunications and electronic devices which enable students and learners to receive instruction from some distant location” (Bruder, 1989, p. 30). Thus, by introducing blended learning, the advantages of the traditional classroom format can be combined with the opportunities from online classes (Harding, A., Kaczynski, D., & Wood, L., 2005).

2.2. Learning styles

The learning process is an essential part of the life cycle of a human being (Dantas & Cunha, 2020). In the course of a person's lifetime, social skills and behaviors are learned and developed, which is why the learning process plays an important role in the organization of cultures, in the educational system and, last but not least, in the creation of new knowledge (Dantas & Cunha, 2020). However, individuals use different methods to ensure their personal learning success, such as graphical representations or discussions (Dantas & Cunha, 2020).

James and Blank (1993) define learning styles as „the complex manner in which, and conditions under which, learners most efficiently and most effectively perceive, process, store, and recall what they are attempting to learn“ (S. 48). Learning is best understood as a process that involves some kind of exchange between the learner and his or her environment, while also considering that person's adaptability (Kolb, 1984; Kolb & Kolb A.Y., 2013). In „Experiential Learning Theory“ Kolb (1984) attempts to connect various factors using a unified learning cycle while dividing them into distinct phases: **concrete** experience (CE), **reflective** observation (RO), **abstract** conceptualization (AC), and **active** experimentation (AE) (Coffield, F., Moseley, D., Hall, E., Ecclestone, K., 2004; Dantas & Cunha, 2020). From this, Kolb (1984) derives the following learning styles: converging (abstract, active), diverging (concrete, reflective), assimilating (abstract, reflective), and accommodating (concrete, active) (Coffield, F., Moseley, D., Hall, E., Ecclestone, K., 2004; Dantas & Cunha, 2020). Based on Kolb's (1984) research, Mumford and Honey (1992), created "The Learning Styles Questionnaire", a questionnaire that surveys the participant's behavior in order to obtain an improvement of this learning style theory (Coffield, F., Moseley, D., Hall, E., Ecclestone, K., 2004). In 2013 Vega, M. C., & Patino, M. D. reduced the size from the original 80 questions to now 32 questions without loss of quality, which is why the name CHAEA-32 questionnaire was created.

Following Kolb's (1984) learning cycle, the learning style "pragmatist", is essential for this study, as (Coffield, F., Moseley, D., Hall, E., Ecclestone, K., 2004; Honey, P., & Mumford, A., 2000).

2.3. Technostress

One of the most significant inventions is certainly the computer, which has not only helped humans to solve tasks faster, more efficiently and more accurately, but has also led to a drastic change in society (Brod, 1984). The human-computer interaction, if imbalanced, can have an impact on the human brain and negatively affect a person's personality (Brod, 1984). Brod (1984) refers to these effects as technostress and defines them as follows: “technostress is a modern disease of adaptation caused by an inability to cope with the new computer technologies in a healthy manner. It manifests itself in two distinct but related ways: in the struggle to accept computer technology, and in the more specialized form of overidentification with computer technology.” (Brod, 1984, p. 16). Typical symptoms that indicate technostress, in addition to a psychological change that resembles the behavior of a computer, are physical symptoms such as headaches, fatigue, muscle tension, shortness of breath and stomach ulcers (Brod, 1984).

The complex construct of stress development is described by Lazarus and Folkman (1984), in their work „Stress, appraisal, and coping“. According to this, a trigger, a so-called stimulus, is called a stressor as soon as it triggers a stressful situation in the person affected (Lazarus & Folkman, 1984). The primary assessment analyzes whether and to what extent the stimulus is to be classified as positive, irrelevant or dangerous or stressful (Lazarus & Folkman, 1984). If the situation has been classified as dangerous, the secondary assessment evaluates the available resources, situational factors, and the effectiveness of the coping strategy. (Lazarus & Folkman, 1984). Afterwards, it is determined whether a situation was dangerous and thus triggered a stress reaction (Lazarus & Folkman, 1984).

To make technostress measurable in organizations in the area of human-computer interaction, Tarafdar, M., Tu, Q., Ragu-Nathan, B. S., & Ragu-Nathan, T. S. (2007), have developed a survey and divided this influencing factor into five dimensions, namely "techno overload", "techno invasion", "techno complexity", "techno insecurity" and "techno uncertainty". The study at hand focuses exclusively on the dimensions of techno-overload, techno-invasion, and techno-complexity by Tarafdar, M., Tu, Q., Ragu-Nathan, B. S., & Ragu-Nathan, T. S. (2007).

3. Methodology

In order to answer the research question, a qualitative approach, which was supported by selected quantitative instruments, was applied. The aim was to specifically pick a sample of undergraduate students of the learning style "pragmatist". Thus, students of a specific undergraduate program of an Austrian university, were asked to participate in an online survey using Google Forms, potentially followed by an approximately 45-minute one-on-one interview.

The aim of the online survey was to identify the predominant learning style (activist, pragmatist, reflector and theorist). The learning style "pragmatist" was chosen because the introduction of blended learning attempts to achieve the greatest possible learning outcome for students. This is done by combining different methods and media to deliver theoretical content electronically and learn or apply practical skills in face-to-face classes. To identify students with this learning style, the simplified CHAEA-32 questionnaire was used including a Likert scale, allowing the respondents to select their agreement from 1 - "not at all" to 4 - "very much".

Through this process 11 students with a pragmatist learning style could be identified and were invited to join the interviews. Since all of the interviewees have already experienced all teaching formats during their studies, namely face-to-face, distance, as well as blended learning, the interview was used to highlight the advantages and disadvantages of each teaching format and to find out about the participants' attitudes towards the blended learning format and their perceived technostress.

In order to accurately grasp the different dimension of technostress, the questionnaire developed by Tarafdar, M., Tu, Q., Ragu-Nathan, B. S., & Ragu-Nathan, T. S. (2007) was used as a basis for the respective questions, which were adapted in order to fit the qualitative research approach. Each interview was first analyzed by applying the "circular deconstruction" analysis method developed by Jaeggi, E., Faas, A., & Mruck, K. (1998), and subsequently subdivided into different categories by using MAXQDA in order to enable a systematic comparison between the interviews in the second analysis phase.

4. Results

In this section, the results are presented according to some of the individual categories of the 11 participants with the learning style "pragmatist".

4.1. Category 1: specificities of the institution

Here the reasons why the interviewees have chosen to study at the respective institution are given as: (1) System of the university, (2) Face-to-face-component, (3) full time component, (4) duration of the program, (5) worked-based learning and (6) reputation of the university.

4.2. Category 2: success factors for teaching

The respondents state that interactive lectures, the lecturers' teaching methods, and the use of theory in a practical application have a positive influence on personal learning success. Some students find individual work and assignments very helpful, while others prefer group work. Additionally it was found that the learning environment plays an essential role and that the lectures should not be too long.

4.3. Category 3: favorite lectures

Interviewees indicate that they found both face-to-face and distance learning lectures exciting, as well as classes that were initially taught as face-to-face and then had to be switched to distance learning due to the COVID 19 pandemic. Some of the students stated that they felt the face-to-face classes were better than distance learning lectures.

4.4. Category 7: electronic devices

Smartphones, computers/laptops/Macbooks and iPads/tablets are used on a daily basis. The switch to distance learning has significantly increased usage. In general, the participants describe themselves as technologically neutral to savvy/active/interested in the use of new technologies.

4.5. Category 8: reaction to the COVID-19 pandemic and shift to distance learning

The switch from face-to-face to distance learning as a result of the COVID-19 pandemic was associated with mixed feelings. In terms of their studies, many were grateful that their studies could continue and that this relieved some of their concerns about the pandemic. In addition, the circumstances were initially perceived as exciting because nothing comparable had ever happened before and the situation was underestimated. In all cases, this event had an impact on students' private lives. Some students spent more time with their families as a result, but less with friends. Due to the restriction measures, it was initially problematic for some to make a clear cut between the university and their private life, but this has improved significantly with the relaxation of the restriction measures.

4.6. Category 10: preferred teaching format

Finally, students were asked which teaching format they would choose if they had the choice to do their studies again. In response, seven chose blended learning and three chose face-to-face learning. One decision in favor of blended learning was invalidated during the text analysis due to inconsistencies.

5. Discussion

The results of the study show that students are favorable toward the blended learning format because the combination of face-to-face and distance learning mitigates the disadvantages of both formats, resulting in more advantages. Many of these advantages are also confirmed in a study by Titthasiri (2013), in which students appreciate, among other things, the group work and group discussion, the social contacts, and the learning atmosphere of face-to-face classes, and positively perceive the time and cost savings as well as the geographical independence of E-learning. Although most students surveyed chose blended learning as their preferred method of teaching, face-to-face instruction also remains popular, while distance learning is largely rejected by students. This rejection is particularly interesting given that students describe themselves as neutral to savvy in their use of new technologies.

To determine whether and to what extent technostress plays a role in relation to the blended learning format, participants in this study were surveyed about their physical and mental state in the context of a lecture in face-to-face and distance learning. Students have reported feeling better in face-to-face classes, but perceived difficulty concentrating, eyestrain, headaches, and mental fatigue/inertia in distance learning. According to Brod (1984), some of these symptoms could be due to technostress, but in this context, the COVID-19 pandemic must be considered as an external influencing factor that led to an intensification of the distance learning format.

6. Limitations

This study has several limitations. The sample size is relatively small, with only 11 participants with the predominant learning style of "pragmatist." The study is also limited to surveying students from a single undergraduate program. Another factor to consider is the identification of learning styles based on students' self-assessment of the CHAEA-32 questionnaire. It was not possible to determine whether and to what extent technostress mattered due to the COVID-19 pandemic that was prevalent at the time. Future studies could collect more data from different educational institutions after the pandemic ends to confirm or add to the findings of this study.

7. Conclusion

The results have shown that students have a favorable attitude towards the blended learning format and that there are more advantages than disadvantages to the mix of face-to-face classes and distance learning. This teaching format provides more flexibility for the students and leads to a mitigation of the disadvantages of both teaching formats. A crucial factor to be considered is good organization and communication to ensure the success of this teaching format. Adapting learning plans can thus expand the reach of students, save time and money for students and teachers, and reduce costs for educational institutions by designing new campus structures.

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