

# Teachers' views about the impact of Learning Design Community platforms on Well-being

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**Abstract**— Since their first advent, digital technologies have been connected to ethical questions and concerns about their impact on people's lives and the well-being of individuals and communities. This case study belongs to a broader framework where we apply an iterative process guided by IEEE P7010-2020 standard for Well-being Impact Assessment to a set of data-driven educational technologies to evaluate their impacts on well-being by collecting subjective and objective data from creators and users. In this paper, we survey teachers from Saudi Arabia (n=68) to investigate their views about the impact of learning design community platforms supported by learning analytics on their well-being based on well-being indicators distributed to twelve domains. The participants identified several possible well-being impacts that are well-aligned with the creators' views. Yet, the potential negative well-being impacts indicated by the studied tool's creators were less likely to occur from the users' perspective.

**Keywords**— *Well-being, Learning Design, Community Platforms, Ethics, Values*

## I. INTRODUCTION

The world of information is today mediated by digital technologies where the growing involvement of data analytics and Artificial Intelligence (AI) in everyday life and their increasing influence on society are likely to present issues with lasting consequences. The individual and societal well-being is becoming intimately connected with the state of our information environment and the digital technologies that underpin our life experiences [1], while global efforts toward evaluating the different impacts of such technologies on human well-being continue to establish guidelines and metrics for such systems to remain human-centric, serving humanity's values and ethical principles. These efforts include two recent productions by the Institute of Electrical and Electronics Engineers (IEEE) under the umbrella of the IEEE global initiative on Ethics of Autonomous and Intelligent Systems (A/IS) that can provide guidance to well-being researchers as well as those creating and using automated data analytics and AI solutions [2]. These two efforts are a chapter on well-being in a publication entitled Ethically Aligned Design (EAD) [3] and a standard entitled P7010-2020 Recommended Practice for Assessing the Impact of Autonomous and Intelligent Systems on Human Well-being, aims at establishing well-being metrics to enable programmers, technologists and engineers to better consider how the products and services they create can enhance human well-being based on a wider spectrum of measures than growth and productivity alone [4].

While AI methods and algorithms are becoming more involved in how decisions are made in public and private life, the presence of this shift in the field of education is represented by various forms of analytics being conducted on

data generating from educational systems and academic technology infrastructure for the purpose of understanding and enhancing learning. Consequently, the collection and use of educational data pose a range of ethical issues, including the location and analysis of data; informed consent, privacy and de-identification of data; and the classification and management of data [5], [6]. Other ethical questions are being tackled by researchers in the field of Learning Analytics (LA) raise thorny questions about how and what data are dealt with in educational environments and extend to societal topics like transparency, trust, fairness, accountability, and social well-being [7], [8], [9], [10]. However, there is a research gap in considering the potential of LA to impact the well-being of learners and teachers from a holistic perspective in ways that go beyond enhancing learning outcomes.

Our work in this paper belongs to a broader framework where we apply an iterative process guided by the IEEE P7010-2020 standard to a set of educational technologies to evaluate their impacts on the well-being of the intended users and stakeholders by these technologies. The particular focus of this paper is to investigate teachers' views about the impact of learning design community platforms on twelve domains of their well-being. To do so, we surveyed 68 Saudi teachers to reflect on well-being indicators selected systematically in a previous stage by researchers involved in creating similar tools [11]. In the following sections, we first briefly review the terms of digital well-being and its implications in the field of education and define learning design community platforms. Second, we explain the methods used in conducting this study. Then we highlight the findings and conclude the paper by discussing the promises and challenges of using IEEE P7010-2020 well-being indicators to evaluate LA-supported technologies.

## II. THEORETICAL BACKGROUNDS

### A. Ethics of Digital Well-being

Since their first advent, digital technologies have been connected to ethical questions and concerns about their impact on people's lives and the well-being of individuals and communities. The expression "digital well-being" is used to refer to the impact of digital technologies on what it means to live a life that is good [12]. Well-being refers to what is directly or ultimately good for a person or population, and it is not limited to one or two dimensions, but rather encompasses the full spectrum of personal, social, and environmental factors that enhance human life and on which human life depends [3].

To the extent that data analytics and AI techniques add to digital technologies in terms of capability and impact, they

add a heavy burden of ethical concerns that are more crucial than ever before. The field of education was like many other sectors affected by the increasing use of digital technologies and thus by the technological pathways opened by the flow of data from such technologies. Big and small data techniques are being presented and used in the field of Education in the form of Learning Analytics (LA), which is defined as the processes of collection, measurement, analysis, and reporting of learners' data for the purpose of understanding and optimizing learning and the environment in which it occurs [13]. As the use of LA has increased, a variety of ethical considerations have covered critical data-related issues like privacy and protection and have extended to other important societal values. However, a significant research gap remains in considering the potential of LA to impact the well-being of learners and teachers from a holistic perspective in ways that go beyond the educational scenarios. A recent review on the theme of digital well-being [1] identify major issues related to four key domains, including education, where digital technologies have increasing roles and impacts, and refer to some articles discuss how some digital technologies could support lifelong learning and openness to new opportunities [14], how gamification-based learning could improve cognitive skills [15]; and how smartphones could automatically detect moods and help with work-life balance and management through increased awareness of stress and emotional understanding [16].

### B. Learning design community platforms

Learning design is defined as “the creative and deliberate act of devising new practices, plans of activity, resources and tools aimed at achieving particular educational aims in a given context” [17]. Learning design community platforms are web-based platforms with integrated lesson planning tools that support teachers in the creation, co-creation, and sharing of designs of learning activities. Teachers are also supported in these environments by data-driven systems that assist the lesson planning with data analytics and pedagogical guidelines.

## III. METHOD AND PREVIOUS WORK

This work is connected to an ongoing iterative process being conducted to evaluate the potential positive and negative impacts of selected LA-supported educational technologies on human well-being [11]. The main question we tackle in this process is: Where and how can educational technologies impact well-being? And how can learning analytics be integrated to help safeguard teacher and student well-being?

To answer this question, we apply the IEEE P7010-2020 recommended practice for Well-being Impact Assessment WIA [4], a methodology and a set of metrics, to a set of cases of educational tools that seek different goals and users. A type of LA-supported educational technologies considered are web-based learning design community platforms with integrated lesson planning tools that support teachers in the creation, co-creation, and sharing of designs of learning activities. In this paper, we survey 68 teachers to help answer the first part of the question above, focusing on learning design community platforms had been assessed subjectively by five creators of similar tools. We attempt to examine the creators' views and contrast them with the views of users. Thus, the particular question we tackle in this study is:

- Where and how can learning design community platforms impact teacher well-being?

### A. IEEE p7010 Well-being Impact Assessment

As a methodology, WIA consists of five activities: 1) Internal, user, and stakeholder analysis, 2) well-being indicators dashboard creation, 3) data collection plan and data collection, 4) well-being data analysis and use of well-being indicators data, and 5) Iteration. This paper is related to the first activity, where subjective and objective data are collected from the creators and the users of each technology to allow its digital well-being to be comprehensively evaluated and improved. The completed work includes an internal analysis conducted by engaging researchers and engineers who created the studied systems in the first task of the IEEE p7010-2020 recommended practice to help identify where these systems would increase or decrease well-being [11]. The IEEE P7010 recommended practice provides 134 indicators drawn from well-being measurement instruments already in use and have been proven to be an accurately measurement instrument (i.e. scientifically valid) to be used to primarily assess the impacts of a wide range of data-driven technologies on each of the following well-being domains: life satisfaction, affect (feelings), psychological well-being, community, culture, education, economy, environment, government, health (physical and mental), human settlement, and work.

The initial internal analysis that we previously conducted was a systematic process designed by IEEE P7010 creators to be applied by the systems developers allowing them to select well-being indicators to identify the areas of well-being impact of each system based on its goals and population of users. The internal analysis of five learning design community platforms resulted in selecting 29 well-being indicators to reflect intended and unintended, positive and negative impacts of learning design communities on the of well-being of the direct users (teachers) and the indirect stakeholders (students). This study focuses only on teachers, so we drive the 37 questionnaire items in Table 1 from well-being indicators was selected to reflect well-being impacts on this type of stakeholders [figure 1].

Figure 1: well-being indicators selected by tool's creators



## B. Data Collection and Participants profile

As this paper aims to investigate the possible well-being impacts of learning design community from the perspective of the intended users of such tools, the invitation to participate in this study was spread among teachers of all levels in Saudi Arabia. They have been teaching and working online due to the Covid-19 restrictions since February 2020 until the end of this academic year in June 2021, allowing them to be more willing now to accept the use of digital tools to support their tasks (beyond only the actual teaching to students, but also lesson planning, collaborating with colleagues, etc.) We arranged a one-hour online session, where 78 teachers were presented to a demo of a specific online learning design community, explaining all its uses and features. Although the tool we demonstrated was a prototype with usability challenges, the participants were able to reflect on it based on not only the extended details provided in the demo, but also on their experience with similar tools and services provided by their educational systems to support them in the novel virtual learning and teaching environment.

Among the attendants, 68 participants (56 females and 12 males) confirmed the consent to participate in the study and completed a questionnaire of 37 Likert items where they were asked to agree or disagree with statements drawn from the IEEE P7010 well-being indicators. About 37% of the participants (25 out of 68) were high school teachers, 35% were primary teachers, 18% were intermediate teachers, and only 7 of the participants (10%) were university instructors. About 66% of the participants have been teaching for more than 15 years, while 16% and 15% of them have been teaching for between 11 and 15 years and between 6 and 10 years, respectively. Only two of them (3%) have less than five years of teaching experience. The responses to the survey have started to arrive 25 minutes after the end of the session and the last response received was about four days later. The video tutorial of the tool was presented in Arabic and has been uploaded to be accessible by the participants after the session.

The survey items in Table 1 were based on scientifically valid well-being indicators driven from IEEE P7010 and include statements that tackle both positive and negative well-being impacts based on hypothesis from the creators' views when they had conducted the internal analysis and selected the indicators. In the cases of assuming both types of impact may occur in different ways and for independent reasons, we formulate two items from the same indicator. For example, from the psychological well-being indicator "Feeling that the things one does are worthwhile" we developed the Likert items: "The use of the tool can make me feel that the things I do are worthwhile" and "The use of the tool can make me feel that the things I do are worthless". The format of each five-level item was as follows: 1. Strongly disagree, 2. Disagree, 3. Neither agree nor disagree, 4. Agree, 5. Strongly agree. It allows the participants to indicate no potential impact when they select the choice number 3. In Table 1, The column of "Agree" represents the percentage of participants who selected 4 and 5, and the "Disagree" column represents the percentage of participants who selected 1 and 2. In Table 2, the positive impact is the average of agreements with positive statements and disagreements with negative statements within a specific well-being domain, while the negative impact is represented by the average of disagreements with positive statements and agreements with negative ones (Tables 1 & 2).

## IV. FINDINGS

### A. Impacts on Life Satisfaction, Affect and Psychology

About 70% of the participants agree that the use of the tool holds potential positive impact on their feeling of life satisfaction, while only 14% indicate that the use of the tool may make them feel unsatisfied with their life. Also, around 66% agree that positive feelings like happiness and calmness can be driven from the use of the tool, while the negative feelings of sadness, dissatisfaction, anxiety, stress, and frustration are indicated as potential outcomes of using the tool by about 16% of the participants. For psychological well-being, about 79% find positive impact of the tool on their feeling that what they do is worthwhile and that they are capable at what they do, while 11% indicate negative impacts on these aspects of psychological well-being.

Table 1: Teachers' answers on the questionnaire (n=68)

Well-being domain	Survey items	Agree	Disagree
	Using the platform can:		
Life satisfaction	increase my satisfaction with life	64.7%	14.7%
	decrease my satisfaction with life	13.2%	76.4%
Affect	make me feel happy	48.5%	20.6%
	make me feel sad	11.7%	79.4%
	make me feel calm	67.6%	20.6%
	make me feel stressed	16.2%	59.2%
	make me feel frustrated	8.8%	75%
Psychological well-being	make me feel that things I do are worthwhile	75%	8.9%
	make me feel that things I do are worthless	13.2%	78%
	make me feel that I am capable at what I do	79.4%	13.2%
	make me feel that I am not capable at what I do	10.3%	82.3%
Community	make me feel that I belong to a community	75%	8.9%
	make me feel that I am rejected by a community	5.9%	85.3%
	increase the approximate total hours a month I was involved in voluntary activities	63.2%	14.7%
	make me feel that if I were in trouble, I would have relatives or friends I can count on to help me whenever I need them	45.6%	33.8%
	make me feel that I can trust people	57.3%	13.2%
	make me feel that I need to be careful in dealing with people	32.3%	27.9%
Culture	increase my chances to engage with / participate in arts or cultural activity	72.1%	11.8%
Economy	increase the degree to which I am worried about losing my job	11.8%	76.4%
	decrease the degree to which I am worried about losing my job	64.7%	16.2%
Environment	increase the degree to which I am satisfied with efforts to preserve the environment	70.6%	8.8%
	increase my knowledge about global warming or climate change	54.4%	17.7%
Government	make me feel that there is a space for freedom of assembly, demonstration, and open discussion	63.2%	11.8%
Health	make me feel energetic and able to get things done	70.6%	13.2%
	make me feel lethargic and not being able to get things done	13.2%	72.1%
Education	increase my opportunities to learn	82.4%	10.3%
Human settlement	enhance my ICT skills	83.8%	7.4%

Well-being domain	Survey items	Agree	Disagree
	Using the platform can:		
Work	increase my satisfaction with job	73.5%	10.3%
	decrease my satisfaction with job	17.6%	75%
	make me feel that my work life is interesting	76.5%	11.7%
	make me feel that my work life is uninteresting	16.2%	76.5%
	make me feel that my supervisors have respect for and care about my welfare	60.3%	16.2%
	make me feel that I get help and support from my co-workers	69.1%	13.2%
	enhance my work productivity	70.1%	14.8%
	increase my satisfaction with the balance between the time spent on the job and the time spent on other aspects of life	63.2%	13.3%
	decrease my satisfaction with the balance between the time spent on the job and the time spent on other aspects of life	17.7%	61.8%
	increase my satisfaction with the opportunities for professional development and promotion in my current primary job	73.5%	13.2%

### B. Impacts on Social and Cultural Well-being

The indicators used to tackle the impact on the domains of community (social well-being) and culture are distributed to the dimensions of belonging, discrimination, community participation, social support, safety, and participation in cultural activity (i.e., art). The reflection on the impact on social well-being include about 75% of the participants agree with potential positive impact on their sense of being a part of a community (i.e., community of teachers), but only 46% believe that they can rely on other members of the community to provide the help and support they need when being in trouble. Also, about 63% consider the use of the platform useful in increasing the approximate total hours a month they are active in voluntary activities, and about 57% find a positive impact of the tool on their sense of trust in each other, against about 31% believe that they need to be careful in dealing with people in such environments. The average of positive reflections on social well-being is about 59%, while about 18% indicate negative impacts on the social aspects above. Finally, one indicator was used to reflect the impact on cultural well-being, resulting in about 72% of the participants find the tool impactful in a positive way on the opportunities they may have to engage with arts or cultural activities.

### C. Impacts on Economic, Environmental and Governmental Well-being

The indicator we used to investigate possible impacts on the economic well-being of the users was related to the dimension of “jobs”, where about 85% (71% positive and 14% negative) agree that the tool may impact its users in the sense of one being worried about losing her job or not finding one. The indicators used to reflect possible impacts of the tool on the well-being domain of environment were the satisfaction with the efforts to preserve the environment and the knowledge about global warming and climate change. About 63% of responses indicate potential positive impacts on these two aspects against 12% for the possible negative impacts. In the case of the government well-being domain, about 64% find that the tool may have a positive impact on their sense of freedom of assembly, demonstration, and public discussion, while about 11% believed the opposite.

### D. Impacts on Health

The indicator used to reflect possible impacts on the domain of health was related to the sense of having enough energy to get things done. About 71% of the participants find the use of the tool may positively impact them in this regard, while about 13% find that it can lead them to a feeling of lethargy and tiredness.

### E. Impacts on Education and Work Well-being

The two indicators used to reflect impacts on the two well-being domains of education and human settlement were both related to lifelong learning, where about 83% of the participants find the tool useful to increase their opportunities to learn new things and improve their ICT skills.

The well-being domain of work was tackled through the two dimensions of workplace environment and work-life balance. The participants’ views on the tool’s impact on workplace environment include about 74% find the tool potentially useful in increasing their job satisfaction and allowing them to see their current work life as an interesting one, against about 15% believe the opposite. About 76% of the participants (60% positive and 16 negative) find the tool relevant to the sense of having supervisors who respect and care about teachers’ welfare. In the same venue, about 69% of the participants agree that the tool may hold a positive impact on their sense of getting help and support from co-workers, against 13% perceive this impact as a negative one. Also, 70% consider the tool among the conditions that allow one to be about as productive as one could be, against 15% consider it harmful to their productivity. On the level of life-work balance, about 63% find that the tool supports their ability to balance between life and work and positively impact their feeling of satisfaction in this regard, while 13% do not believe so and indicate a negative impact on this aspect. Finally, about 74% of the participants recognize the tool positively impactful on their satisfaction with opportunities for professional development and promotion in their jobs, against 13% find it impactful in a negative way.

Table 2: Summary of teachers’ views about the impact of the platform on each well-being domain (n=68)

Well-being domain	Positive impact	Negative impact
Life satisfaction	70.55%	13.63%
Affect	65.94%	15.85%
Psychological well-being	78.68%	11.4%
Community	59.05%	18.13%
Culture	72.1%	11.8%
Economy	70.55%	14%
Environment	63.2%	11.8%
Government	63.64%	10.61%
Health	71.35%	13.2%
Education	82.4%	10.3%
Human Settlement	83.8%	7.4%
Work	70%	14.42%

## V. DISCUSSION AND CONCLUSION

We investigate in this study the teachers’ views about the impact of web-based learning design community platforms on twelve domains of human well-being. We survey 68 teachers by using well-being indicators from the IEEE P7010-2020 recommended practice for Well-being Impact Assessment, that were selected based on internal analysis conducted by researchers involved in creating and managing such tools. The

teachers' views are, to a considerable extent, well aligned with the hypotheses put by the systems' creators of potential intended and unintended positive impacts of these tools on different dimensions of teacher well-being. However, they do not align with the hypotheses of negative impacts, neither the ones suggested by the systems' creators nor those ones added by us to balance the survey. A possible reason for this could be the differences on the levels of criticism and awareness of harms between the systems' creators (i.e., researchers) and the users (i.e., teachers). In the stage preceding this study, the researchers had attempted to adhere to the IEEE P7010 internal analysis regarding the rigor of their assessment of the well-being impacts, by assuming several scenarios of varying likelihood of occurrence, some of which are found unlikely by the users. For example, the researchers find that the negative feelings of anxiety and frustration can be resulting from the feeling of being monitored, the need to contribute to the collaborative community, and the feeling of not being creative enough when exploring peers' work, while most of the teachers in this study do not report such possibilities.

It is important to indicate that the WIA approach is limited to assess the well-being impact based on a range of well-being indicators that can be relevant to various data-driven digital technologies, but not to many others. Moreover, the approach does not tackle neither the harms that can be induced by the misuse of data, nor the data agency principles such as privacy and fairness. Hence, the process of data collection and management for the use of IEEE P7010 recommended practice can itself have negative impacts on well-being. Therefore, other codes and guidelines (e.g., data protection regulations such as GDPR in Europe, IEEE P7003TM Standard for Algorithmic Bias Considerations) have to be followed in conjunction with the application of this standard to address ethical considerations related to data agency. Overall, the process of identifying well-being impacts based on subjective and objective reflections on selected well-being indicators represents only an initial step and a starting point toward full consideration and evaluation of the impact of learning technologies on well-being, including finding data sources that are useful to detect well-being issues, and design of technical intervention toward better well-being impacts of data-supported learning technologies.

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