

Adaption to Climate Change as a Challenge for the Manufacturing Industry: Finding Business Strategies by Game-Based Learning

Authors : Jan Schmitt, Sophie Fischer

Abstract : After the Corona pandemic, climate change is a further, long-lasting challenge the society must deal with. An ongoing climate change need to be prevented. Nevertheless, the adoption to the already changed climate conditions has to be focused in many sectors. Recently, the decisive role of the economic sector with high value added can be seen in the Corona crisis. Hence, manufacturing industry as such a sector, needs to be prepared for climate change and adaption. Several examples from the manufacturing industry show the importance of a strategic effort in this field: The outsourcing of a major parts of the value chain to suppliers in other countries and optimizing procurement logistics in a time-, storage- and cost-efficient manner within a network of global value creation, can lead vulnerable impacts due to climate-related disruptions. E.g. the total damage costs after the 2011 flood disaster in Thailand, including costs for delivery failures, were estimated at 45 billion US dollars worldwide. German car manufacturers were also affected by supply bottlenecks and have close its plant in Thailand for a short time. Another OEM must reduce the production output. In this contribution, a game-based learning approach is presented, which should enable manufacturing companies to derive their own strategies for climate adaption out of a mix of different actions. Based on data from a regional study of small, medium and large manufacturing companies in Mainfranken, a strongly industrialized region of northern Bavaria (Germany) the game-based learning approach is designed. Out of this, the actual state of efforts due to climate adaption is evaluated. First, the results are used to collect single actions for manufacturing companies and second, further actions can be identified. Then, a variety of climate adaption activities can be clustered according to the scope of activity of the company. The combination of different actions e.g. the renewal of the building envelope with regard to thermal insulation, its benefits and drawbacks leads to a specific strategy for climate adaption for each company. Within the game-based approach, the players take on different roles in a fictional company and discuss the order and the characteristics of each action taken into their climate adaption strategy. Different indicators such as economic, ecologic and stakeholder satisfaction compare the success of the respective measures in a competitive format with other virtual companies deriving their own strategy. A "play through" climate change scenarios with targeted adaptation actions illustrate the impact of different actions and their combination on the fictional company.

Keywords : business strategy, climate change, climate adaption, game-based learning

Conference Title : ICEGDDBL 2022 : International Conference on Educational Game Development and Game-Based Learning

Conference Location : Paris, France

Conference Dates : September 20-21, 2022