Master’s Thesis

“The Effect of Group Model Building on Self-Efficacy”

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Abstract

This research study is about how Group Model Building methodology affects self-efficacy of stakeholders in their daily life. This study attempts to explain why some participants feel capable of performing one task in their work duty and not so confident about another task. The research is aimed to explore the possible reasons whether after Group Model Building the outcomes of participants’ personal capability judgments can differ from their initial expectations. It is extremely important to study and reach conclusions on how Group Model Building technique affects self-efficacy, since the latter has an important role in how people feel and think, motivate and eventually behave themselves. These altogether make Group Model Building an important tool, which affects self-efficacy and as a result determines the way the participant will behave, making such Group Model Building experience for the participant life-changing.

Investigation of this issue is based on systematic literature review of various previous studies about self-efficacy, sources of self-efficacy, Group Model Building method, dynamics in self-efficacy, task complexity awareness, connections of self-efficacy and work-related performance, and interventions to improve self-efficacy.

Keywords: Self-Efficacy, Sources of Self-Efficacy, Group Model Building, GMB, Dynamics in Self-Efficacy, Task Complexity Awareness.
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1. INTRODUCTION

1.1 Group Model Building & Self-efficacy

There are many strategic dilemmas in each organization, and every time choices need to be made regarding some particular problematic issues, such decisions often affect not only one group of people, but also may affect the entire organization. It used to be that only one person at the very top of the organization made most of the strategic decisions. Nowadays, teams become the critical building blocks upon which the performance of modern organizations depend (Vennix, 1996). Teams rather than top individuals now address as a result strategic problems, not only because the ‘command and control’ organization has become obsolete but also because the complexity and uncertainty of the problem will overwhelm the cognitive capacities of any one individual (Vennix, 1996). Moreover, several strategic problems may be interrelated thus increasing the complexity of the problems. This has led a number of authors to coin the term 'messy' problems (Vennix, 1996). By ‘messy’ problems it is designated that different people have absolutely different views and opinions about the situation and as a result, they have a completely different perception of the problem.

That’s where intervention method called Group Model Building takes over, this system dynamics method is used to elicit knowledge from stakeholders and create a shared understanding of a problem in the team through discussion. The process of Group Model Building starts from the exchange of different perceptions of the participants and sharing their unique mental models. Group Model Building elicits and integrates these mental models into a more holistic view of the problem. Over the last decades, it was convincingly demonstrated in various studies (Rodriguez Takeuchi, Hien, & Cirenia, 2015), that once a group of people gathers, the differences between people’s opinions and viewpoints can be very useful and helpful. On one hand, the more different perspectives are considered, the bigger the chances on a shared and more suitable problem definition, which stakeholders understand. Better understanding of the issue thereafter will lead to resolving the identified problem. In other words, differences of opinion should be seen as beneficial, because stakeholders who initially came with a messy problem now have a better understanding and feel more confident about the issue. On the other hand, however, it is also known that differences of viewpoints during such sessions can give rise to frustrating and confusing discussions. Such situations usually
result in inefficient discussions and arguments, which therefore cause even more confusion in the common understanding of the issue. During prolonged discussions of the current problem unexpectedly for themselves, stakeholders discover a huge amount of new details, which make the decision-making process for them more challenging. As a result, stakeholders feel overwhelmed, confused and lost even more than they were initially, with no clear understanding of the matter (Omisore, 2014).

People seem to disregard and not notice interconnections between different elements in a system (Meadows, 2009). And in case they want to see problems more holistically they generally lack the expertise or clarity to identify and structure the relations between elements in the system. Group Model Building presumes that people are willing to question their viewpoints. In that sense system dynamics can be helpful to create a more comprehensive problem description by eliciting the hidden causal assumptions that all of us automatically hold and by integrating these into a more complete problem representation. The primary goal of Group Model Building approach is not building the model itself, but rather to get a group engaged in building a system dynamics model of a problem. This process is helpful to increase problem understanding and to advice courses of action to which team members will feel committed (Eden, 1995) and willing to further discuss the problem to find a way to resolve the issue. In other words, Group Model Building is a method where stakeholders share their views on the problem, their definition of the issue, exchange their perceptions and explore the common understanding of the dilemma, what are its causes and how they can deal with it.

Being more art than science (Andersen, Richardson, & Vennix, 1997), the beauty of Group Model Building tool is in its ability to simplify very complex concepts. Understanding is usually the first step to solving a problem, because stakeholders see the picture of the situation they are in. But what if all these structure and causal relationship provided by system dynamics in Group Model Building sessions, instead of increasing problem understanding, will on the contrary decrease it by overwhelming stakeholders with a tremendous amount of new information, hidden causal relations, diverse and contradicting opinions on the same situation? What if for some stakeholders, lack of knowledge about this particular issue or realization of high complexity of the problem discovered during a Group Model Building session will have a different effect? The next question is will these Group Model Building sessions help such stakeholders to resolve the problem in their daily working environment and improve their actual performance? How will their further behavior be influenced by Group Model Building?
Group Model Building generally claims to increase performance (Stajkovic & Luthans, 1998), however, some of the Group Model Building projects fail, thus results on performance are mixed. The explanation for the mixed results could be that Group Model Building differently influences self-efficacy and the process might even overwhelm the participants. For this reason, more research is needed on how Group Model Building affects self-efficacy in order to strengthen the potential positive influences and avoid the potential negative influences.

Now the term called self-efficacy can be introduced. Self-efficacy refers to an individual's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives (Bandura, 1994). Confidence in control over someone’s motivation, social environment and behavior is represented by self-efficacy. Such self-evaluations influence all types of human experience, which includes personal aims, which people try to achieve, and how much energy they spend toward achieving their goal, as well as likelihood of performing a particular behavior. Unlike traditional psychological constructs, self-efficacy beliefs are hypothesized to vary depending on the domain of functioning and circumstances surrounding the occurrence of behavior. Self-efficacy beliefs determine how people feel, think, motivate themselves and eventually behave (Bandura, 1994). A strong sense of efficacy enhances human accomplishment and personal well-being in many ways. People with high confidence in their capabilities approach difficult tasks as challenges to be mastered rather than as threats to be avoided (Bandura, 1994). Such an efficacious outlook fosters intrinsic interest and deep engrossment in activities. They set themselves challenging goals and maintain strong commitment to them. They heighten and sustain their efforts in the face of failure. They quickly recover their sense of efficacy after failures or setbacks. They attribute failure to insufficient effort or deficient knowledge and skills which are acquirable. They approach threatening situations with assurance that they can exercise control over them. Such an efficacious outlook produces personal accomplishments, reduces stress and lowers vulnerability to depression (Bandura, 1994).

On the contrary, people who doubt their abilities avoid the difficult tasks that they see as personal threats. They have low aspirations and a weak commitment to the goals they prefer to pursue. When faced with difficult tasks, they focus on their personal shortcomings, on the obstacles they face, and on any unfavorable outcomes, rather than focusing on how to work successfully. They weaken their efforts and quickly surrender in the face of difficulties. They
slowly restore their sense of effectiveness after failures or failures. Because they see inadequate performance as a poor physical condition, they do not need to endure too much to lose faith in their abilities. They easily fall victim to stress, depression and do not have the motivation to improve the effectiveness of their actions (Bandura, 1994).

Overwhelming amount of information might decrease self-efficacy, whereas the described increased understanding of a problem might increase self-efficacy of the participant. This study needs to be conducted in order to prevent Group Model Building stakeholders from the aforementioned unpleasant outcomes and to understand how Group Model Building technique affects self-efficacy, whether after the sessions stakeholders feel an increase in their self-efficacy or a decline.

1.2 Research Question & Objective

The research aims at exploring how Group Model Building affects self-efficacy of participants of Group Model Building sessions and address a gap in the existing literature by establishing a link between self-efficacy and Group Model Building. The relevance of this study lays in the importance of understanding how Group Model Building (GMB) sessions affect individuals’ self-efficacy in order to further explore whether it helps people with their daily tasks and if so, shed light on importance of exploring how this process can be improved. Self-efficacy is a cognitive factor that plays an influential role in the exercise of personal control over motivation (Bandura, 1989a), and it is defined as personal judgments of how well one can execute courses of action required to deal with a prospective situation. Self-efficacy plays a major part in determining people’s chances of success and quality of performance in any task (Bandura, 1997). So, the study raises the issue how self-efficacy of participants changes due to the Group Model Building process, and whether the changed behavior of participants leads to a more successful outcome in terms of performing their task in the project they are involved in. Research on the effect of group intervention on individual behavior is crucial, also because the successful impact of the Group Model Building session depends on group performance, which in turn depends entirely on individual behavior of participants (Vennix, 1999).
1.2.1 Research Objective

The research objective is to explore what effects the Group Model Building process has on self-efficacy of a stakeholder. It is an important area to study, as in meta-analysis on work-related performance by Stajkovic & Luthans (Stajkovic & Luthans, 1998) stated that “individuals who have high self-efficacy will exert sufficient effort that, if well executed, lead to successful outcomes, whereas those with low self-efficacy are likely to cease effort early and fail”. This means that if the effects the Group Model Building process has on self-efficacy will be identified, it will be possible to provide some recommendations in order to improve the way Group Model Building affects self-efficacy, which could potentially improve their behavior in resolving daily tasks and identify the connection between Group Model Building method and Self-efficacy theory.

1.2.2 Research question

For the objective of this research, the following question is addressed: **What is the effect of Group Model Building on self-efficacy of a participant in a Group Model Building session?**

**Research goals:**

1. Based on causality concepts underlying the system dynamics theory it could be assumed that self-efficacy of a participant is not a stand-alone phenomenon, but can be affected by various factors and might change throughout the project sessions and project development. Finding out how Group Model building affects self-efficacy, and whether this change is positive or negative, using a systematic literature review on previous studies about self-efficacy, task complexity and performance, and also self-efficacy literature in general could help to contribute to improving self-efficacy of participants. Further suggestions can be made to improve and develop Group Model Building to have an increased positive effect on self-efficacy of participants.

2. Suggest a task specific self-efficacy questionnaire, which is based on general self-efficacy questionnaire. Further adopted in Group Model Building sessions, it will help to gather relevant information for further research required.
1.3 Research Outline

The first chapter of this thesis introduced the approach of Group Model Building as a tool which helps in problem identification and searching for its solution. In this chapter the term self-efficacy was introduced as well, and its importance is underlined. The first chapter also defined this research’s main purpose of the investigation and research objectives. In the second chapter, I will indicate the methodology to answer the research question including structured data collection for the systematic review. In the chapter that follows, relevant prior literature on the Group Model Building method, and self-efficacy, its constructs, as well as modelling efforts of self-efficacy will be reviewed. Relevant theories with regard to the research objective will be discussed. Subsequently, in the fourth chapter, I present the results and findings, and demonstrate the Causal Loop Diagram with the relevant to Group Model Building variables and explain their causal connections to self-efficacy. Chapter five includes discussion and synthesis of identified sources of self-efficacy with Group Model Building intervention method. The task specific questionnaire is also suggested for further research on how the participants perceive their self-efficacy. The same chapter elaborates on the practical implications of the study in an aim to help the stakeholders to improve the Group Model Building method to have a better and stronger influence on self-efficacy of the stakeholders. Chapter six concludes the research and summarizes the answer to the research question. Finally, chapter seven presents the study’s limitations and suggestions for the future research.

2. METHODOLOGY

2.1 Research Strategy

In order to achieve the goal of my thesis - to identify how Group Model Building affects self-efficacy - I decided to conduct a systematic literature review. Such an approach is suitable to address the topic of my thesis, since it is a well-planned review, used to answer specific research questions using a systematic and explicit methodology to identify, select and critically evaluate results of the studies included in the review (Rother, 2007). Another reason for this choice is that systematic literature review articles are considered original work because they
are conducted using rigorous methodological approaches (Rother, 2007). Such a type of methodology is accepted to be more specific, and the selection of the articles is uniformly applied and criterion-based, making findings to be more rigorously selected, by excluding possible biases. (Ferreira González, Urrútia, & Alonso-Coello, 2011)

This literature review examines key findings contained in publications, which are relevant to my specific area of study, with the purpose of finding out what is already known about the subject matter (Denscombe, 2012), which is self-efficacy and the relation between Group Model Building and self-efficacy. To find theoretical contributions about self-efficacy I used the well-trusted Web of Science database, the reason for that was because it is important to limit the search by looking specifically for relevant publications and articles.

This research implies a systematic literature review of different studies on self-efficacy, its causes and effects. This attempt is done to identify any possible links and connections of Group Model Building, and issues in group setting environment with self-efficacy. There existing body of literature on how self-efficacy affects other areas of human life is quite rich, however, the available literature on what could possibly affect self-efficacy is not exhaustive, as it seems to be less of a research done in exploring the constructs of self-efficacy itself and what affects it. Moreover, there is no comprehensive overview on whether there is any link between GMB and self-efficacy, so that this system dynamics approach could have a ground to manifest itself in the area of self-efficacy and possibly affect it.

Such a review has not been done before on this topic, so it proves to be a good opportunity to explore what is out there in academic world on this topic of self-efficacy and especially its causes, not only effects.

A systematic literature review is chosen to help understanding how Group Model Building affects self-efficacy. In order to do that I used the Web of Science database as the main source of the academic literature on the considered topic. The search tool was used with the specific criteria identified exclusively for this particular topic. The criteria will be thoroughly discussed further in the next chapter of my thesis. The articles are classified according to relevance and connection to self-efficacy and Group Model Building, and variables mentioned or assumed from the articles will be extracted for a Causal Loop Diagram. The Causal Loop Diagram shows the causal links among variables, with arrows from to a cause from an effect (Sterman, 2000) in order to have a representation of the possible links and interrelations of the mentioned terms.
With the recently discussed by Vincent De Gooyert work on how to use system dynamics for theoretical contribution (De Gooyert, 2016), exploring the effects Group Model Building methodology has on self-efficacy, will help arriving at theoretical contributions in Group Model Building theory. This would be done by exploring the necessity in analyzing currently available relevant literature and conducted studies and researches on self-efficacy and find a possible connection of Group Model Building approach with constructs of self-efficacy. Building a Causal Loop Diagram gives an opportunity to visualize these connections in order to identify whether and how Group Model Building affects self-efficacy of the participants to help them to improve their daily job towards solving a problem they identified during their Group Model Building sessions.

A systematic review will be done with the searches of gathering various relevant papers available so far about self-efficacy and Group Model Building.

The findings will be identified and synthesized with studies that directly relate to the research question, with Group Model Building literature as far as it is relevant to the research question and also with the self-efficacy literature relevant to the research question was researched. This paper is an attempt to find out whether there is an effect of Group Model Building on self-efficacy. Establishing the connection between Group Model Building and self-efficacy, studying and reviewing relevant literature about self-efficacy and about Group Model Building, analyzing already conducted researches and their data and results, analyzing the relevance of existing self-efficacy theories are the main components of the research design of this paper. Since for current moment there is no obvious link between self-efficacy and Group Model Building technique described and identified in any academic papers, this research will be the start of the new path of discovering the links between two different fields.

3. THEORETICAL BACKGROUND

3.1 Overview of Key Theoretical Concepts

In the very abstract world of psychology there is a very thin line between following interconnected terms and their definitions: self-efficacy, self-esteem and self-confidence. The focus of my research is on self-efficacy, so it is important to clearly distinguish what is stated behind it. Self-efficacy development is closely intertwined with a person's experiences,
competencies and developmental tasks in different domains at different stages in life. Self-efficacy beliefs lead to specific behaviors and motivations that can encourage or discourage effective performance (Sharma & Nasa, 2014).

1. **Self-efficacy** - self-efficacy in the definition of Bandura (Bandura, 1994) is people’s judgement of their capabilities to organize and execute courses of action required attaining designated types of performances. In our case, it is important to analyse how Group Model Building affects participants’ judgements of their capabilities and their own expectations of whether they can or cannot actually achieve what they think they could.


3. **Self-confidence** - self-confidence refers to the belief in one's personal worth and likelihood of succeeding. Self-confidence is a combination of self-esteem and general self-efficacy (Bramante, 2016).

Some system dynamics terms need to be introduced, because a Causal Loop Diagram will be used to illustrate the proper cause-effect relationships

4. **Causal Loop Diagram** - a causal loop diagram (CLD) explains the behavior of a system by showing a collection of connected nodes and the feedback loops created by the connections. CLDs are flexible and useful tools for diagramming the feedback structure of systems in any domain. Causal diagrams are simply maps showing the causal links among variables with arrows from a cause to an effect (Sterman, 2000).

5. **Reinforcing Feedback Loop** - a change in a node goes around the loop to cause a change in that same node in the same direction, which causes the variable in the system to grow or decline, meaning that a positive, or reinforcing, feedback loop reinforces change with even more change (Kirkwood, 2013).

6. **Balancing Feedback Loop** – the change is in the opposite direction, which causes the loop to balance its behavior as it seeks a goal of some kind. So, a negative, or balancing, feedback loop seeks a goal. If the current level of the variable of interest is above the goal, then the loop structure pushes its value down, while if the current level is below the goal, the loop structure pushes its value up (Kirkwood, 2013).
It should be noted that the construct of self-efficacy differs from the colloquial term "confidence." Confidence is a nondescript term that refers to strength of belief but does not necessarily specify what the certainty is about (Gernigon & Delloye, 2003). I can be supremely confident that I will fail at an endeavor. Perceived self-efficacy refers to belief in one's agentive capabilities that one can achieve given levels of attainment. A self-efficacy assessment, therefore, includes both an affirmation of a capability level and the strength of that belief. Confidence is a catchword rather than a construct embedded in a theoretical system. “Advances in a field are best achieved by constructs that fully reflect the phenomena of interest and are rooted in a theory that specifies their determinants, mediating processes, and multiple effects. Theory-based constructs pay dividends in understanding and operational guidance. The terms used to characterize personal agency, therefore, represent more than merely lexical preferences” (Bandura, 1997).

It is important to investigate this issue in order to understand better the role of self-efficacy as part of the purpose of the Group Model Building, in other words the effect Group Model Building has on self-efficacy, meaning that self-efficacy is dependent, and participation in Group Model Building considered as independent variable. The model below (Figure1.) illustrates why it is important to understand more self-efficacy as part of the purpose of the Group Model Building, and why the effect of Group Model Building has on self-efficacy is an issue to investigate. The goal of Group Model Building sessions is to identify the definition of the problem and find the most suitable solution for this problem, so coming up with solutions to reach Successful Outcome of a task is the perfect scenario for Group Model Building. The higher the Level of Self-Efficacy of participants, the more these stakeholders feel they are able to reach Success, so they expect themselves to do their best to contribute to problem solving in daily life as well after gaining more conceptual insights throughout the sessions. More Successful Outcomes means more Success, and more Success let these stakeholders to be assured in their capabilities of performing the task, so, as a result, they will have higher Level of Self-Efficacy. Judgments of the participants and their expectations about own capabilities were met, since they were able to perform as good (or even better) as they expected themselves to perform at the very beginning of the Group Model Building process, so the positive result just boosts the belief in their own strength. This is a reinforcing loop. (Figure 1.)
A higher Level of Self-efficacy leads to more Effort to Overcome Obstacles, because the participants believe that they can do something about a particular obstacle and put enough efforts to solve the problem. More Effort to Overcome Obstacles leads to more Success, logically speaking, the more efforts people invest, the better results they get. More Success leads to a higher Level of Self-Efficacy, because again the positive result boosts the belief of stakeholders in their own strength and capabilities. This is also a reinforcing loop. This general idea of self-efficacy and its relation to successful outcomes is built and represented on Causal Loop Diagram in Figure 1.

3.2 Sources of Self-efficacy

Social Cognitive Theory

A substantial body of knowledge on Social Cognitive Theory was developed by Albert Bandura, who is known as the originator of the theoretical construct of self-efficacy, being fourth most-frequently cited psychologist of all time, and due to his great contributions to the field of psychology, including Social Cognitive Theory his works are considered to be very reliable. Albert Bandura explains how self-efficacy can be influenced and developed, and how it effects all facets of human experience. His research on self-efficacy is used as a reliable basis for this thesis and will help to explore whether Group Model Building can have an effect on self-efficacy and manifest itself in its constructs. First, it is needed to understand Albert Bandura’s Social Cognitive Theory.
Social Cognitive Theory states that people are not driven by inner forces or controlled by their environments. The theory posits that people motivate their own behavior and development. Sociocultural influences and other events often influence people’s decision making and, as a consequence, their behavior. There are several issues addressed within the Social Cognitive Theory framework that help to explain the lack of motivation and persistence of a stakeholder towards reaching his or her goal from what they think about their own self-efficacy, and at the same time Social Cognitive Theory also offers the causes that can be the reasons for increased self-efficacy of a decision maker. So the fact that Group Model Building technique gathers people with different perspectives on the same issue, and brings the problem to their attention can be summed up as noted by Bandura as follows: “diversity in social practices produces substantial individual differences in the capabilities that are cultivated and those that remain underdeveloped” (Bandura, 1989a).

According to Social Cognitive Theory (Bandura, 1989b) people's beliefs about their efficacy can be developed by four main sources of influence, which are:

- Mastery Experience
- Vicarious Experience
- Verbal Persuasion
- Emotional & Physiological States

A fifth source of self-efficacy suggested by psychologist James Maddux is Imaginal Experiences and is also included in the list of sources of influence on self-efficacy. The fifth route to self-efficacy through “imaginal experiences” is the art of visualizing yourself behaving effectively or successfully in a given situation (Maddux, 2000). As it is stated that “live or filmed models may be difficult to obtain, but the imagination is an easily harnessed resource. Imagining ourselves engaging in feared behaviors or overcoming difficulties can be used to enhance self-efficacy. For example, cognitive therapy of anxiety and fear problems often involves modifying visual images of danger and anxiety, including images of coping effectively with the feared situation” (Maddux, 2000) It is not further considered in this research since this suggested construct was rarely mentioned in the literature, thus it cannot be equally considered as Albert Bandura’s sources of self-efficacy, though it is still important to mention the existence of such suggestion.
Mastery Experience

The most effective way to create a strong sense of efficacy is through the mastery experience. Success builds a credible faith in your personal efficacy (Bandura, 1994). Failures undermine it, especially if there are failures before the sense of efficacy is firmly established. If people experience only easy successes, they expect quick results and are easily discouraged by failure. A resilient sense of efficacy requires experience to overcome obstacles through constant efforts. Some failures and difficulties in human activities have a useful purpose in teaching that success usually requires constant effort. After people are convinced, they have everything they need to be successful, they persist in the face of adversity and they are quick to rebound in the face of failure, so that in difficult times, they become even stronger from adversity. In fact, random failures, which are then overcome by determined efforts can strengthen self-motivated perseverance if you discover from your own experience that even the most difficult obstacles can be overcome with constant efforts. Therefore, the consequences of abandoning personal effectiveness partly depend on time and on the overall picture of the experience in which failures occur. After establishment, the greatest self-efficacy tends to generalize to other situations in which productivity has been weakened by concerns about personal disabilities. As a result, better behavior transfers not only to similar situations, but also to activities that differ significantly from those directed to treatment (Bandura, 1977). Therefore, for example, greater self-efficacy, obtained through rapid mastery of a phobia of a particular animal, can strengthen efforts to combat social situations and also reduce the fears of other animals. However, the effects of generalization are more predictable for activities that are more similar to those in which self-efficacy has been restored through treatment.

Providing opportunities for people to gain mastery experience is the reason why internships, workshops, different types of training programs are offered everywhere nowadays in every field. It might seem that mastering something new is quite easy, the main thing to do is to practice, however, it is not always the case. As it is mentioned by Albert Bandura (Bandura, 1994) if the new tasks are always easy and similar to the ones already mastered , and difficult unfamiliar ones are avoided, then strong sense of self-efficacy does not develop. To develop a strong sense of efficacy, difficult tasks need to be attempted, and obstacles worked through (Bandura, 1994).
Vicarious Experience

The second way of creating and strengthening self-beliefs of efficacy is through the vicarious experiences provided by social models. This source of information is weaker than mastery experience in helping create self-efficacy beliefs, but when people are uncertain about their own abilities or when they have limited prior experience, they become more sensitive to it. Seeing people similar to oneself succeed by sustained effort raises observers' beliefs that they too possess the capabilities master comparable activities to succeed. By the same token, observing others fail despite high effort lowers observers' judgments of their own efficacy and undermines their efforts (Bandura, 1994). The impact of modeling on perceived self-efficacy is strongly influenced by perceived similarity to the models. The greater the assumed similarity the more persuasive are the models' successes and failures. If people see the models as very different from themselves their perceived self-efficacy is not strongly influenced by the models' behavior and the results its produces (Bandura, 1994).

Modeling influences do more than provide a social standard against which to judge one's own capabilities. People seek proficient models who possess the competencies to which they aspire. Through their behavior and expressed ways of thinking, competent models transmit knowledge and teach observers effective skills and strategies for managing environmental demands. Acquisition of better means raises perceived self-efficacy (Pajares, 2002).

The effects of modeling are particularly relevant in this context, especially when the individual has little prior experience with the task. Even experienced and self-efficacious individuals, however, will raise their self-efficacy even higher if models teach them better ways of doing things. Vicarious experience is particularly powerful when observers see similarities in some attribute and then assume that the model's performance is diagnostic of their own capability. For example, a girl will raise her perceived physical efficacy on seeing a woman model exhibit physical strength but not after seeing a male model do so. In this case, gender is the attribute for assumed similarity. Observing the successes of such models contributes to the observers' beliefs about their own capabilities ("If they can do it, so can I!"). Conversely, watching models with perceived similar attributes fail can undermine the observers' beliefs about their own capability to succeed. When people perceive the model's attributes as highly divergent from their own, the influence of vicarious experience is greatly minimized. It bears noting that people seek out models who possess qualities they admire and capabilities to which they aspire.
A significant model in one's life can help instill self-beliefs that will influence the course and direction that life will take (Pajares, 2002).

**Verbal Persuasion**

Social persuasion is a third way of strengthening people's beliefs that they have what it takes to succeed. People who are persuaded verbally that they possess the capabilities to master given activities are likely to mobilize greater effort and sustain it than if they harbor self-doubts and dwell on personal deficiencies when problems arise. To the extent that persuasive boosts in perceived self-efficacy lead people to try hard enough to succeed, they promote development of skills and a sense of personal efficacy. It is more difficult to instill high beliefs of personal efficacy by social persuasion alone than to undermine it. Unrealistic boosts in efficacy are quickly disconfirmed by disappointing results of one's efforts. But people who have been persuaded that they lack capabilities tend to avoid challenging activities that cultivate potentialities and give up quickly in the face of difficulties. By constricting activities and undermining motivation, disbelief in one’s capabilities creates its own behavioral validation. Successful efficacy builders do more than convey positive appraisals. In addition to raising people's beliefs in their capabilities, they structure situations for them in ways that bring success and avoid placing people in situations prematurely where they are likely to fail often. They measure success in terms of self-improvement rather than by triumphs over others. People also rely partly on their somatic and emotional states in judging their capabilities. They interpret their stress reactions and tension as signs of vulnerability to poor performance. In activities involving strength and stamina, people judge their fatigue, aches and pains as signs of physical debility (Bandura, 1994). Mood also affects people's judgments of their personal efficacy. Positive mood enhances perceived self-efficacy, despondent mood diminishes it. Individuals also create and develop self-efficacy beliefs as a result of the social persuasions they receive from others. These persuasions can involve exposure to the verbal judgments that others provide. Persuaders play an important part in the development of an individual's self-beliefs. “But social persuasions should not be confused with knee jerk praise or empty inspirational homilies. Effective persuaders must cultivate people's beliefs in their capabilities while at the same time ensuring that the envisioned success is attainable. And, just as positive persuasions may work to encourage and empower, negative persuasions can work to defeat and weaken self-efficacy beliefs” (Bandura, 1994). In fact, it turns out that it is usually easier to weaken the beliefs of self-efficacy by giving negative assessments, than to reinforce such beliefs through continuous positive encouragement.
Emotional & Physiological States

The fourth way of modifying self-beliefs of efficacy by Bandura is to reduce people's stress reactions and alter their negative emotional proclivities and misinterpretations of their physical states. The most important is the way how the particular emotional or physical reaction will be interpreted, not its intensity or even existence. Somatic and emotional states such as anxiety, stress, arousal, and mood states also provide information about efficacy beliefs. People can gauge their degree of confidence by the emotional state they experience as they contemplate an action. Strong emotional reactions to a task provide cues about the anticipated success or failure of the outcome. When they experience negative thoughts and fears about their capabilities, those affective reactions can themselves lower self-efficacy perceptions and trigger additional stress and agitation that help ensure the inadequate performance they fear. Of course, judgments of self-efficacy from somatic and emotional states are not necessarily linked to task cues. Individuals in a depressed mood lower their efficacy independent of task cues. One way to raise self-efficacy beliefs is to improve physical and emotional wellbeing and reduce negative emotional states. Because individuals have the capability to alter their own thinking and feeling, enhanced self-efficacy beliefs can, in turn, powerfully influence the physiological states themselves. As it has been observed, people live in psychic environments that are primarily of their own making (Pajares, 2002). We usually feel more self-efficacious when we are calm than when we are aroused and distressed. Thus, strategies for controlling and reducing emotional arousal (specifically anxiety) while attempting new behaviors should increase self-efficacy and increase the likelihood of successful implementation. Hypnosis, biofeedback, relaxation training, meditation, and medication are the most common strategies for reducing the physiological arousal typically associated with low self-efficacy and poor performance (Maddux, 2000).

3.3 Self-efficacy, Group Model Building and Task Complexity Awareness

The high or low self-efficacy, combined with favorable or unfavorable environmental conditions, allows four possible predictions (Bandura, 1989b). When self-efficacy is high and environmental conditions are favorable, a successful outcome is the most likely. When low efficiency is combined with favorable conditions, a person can become depressed when they see how others achieve things that, in and of themselves, seem too complex. When people with
high self-efficacy are in an unfavorable situation, they generally increase their efforts, trying to change the environment. They can use protests, social activities or even force to achieve the necessary changes, but if all their attempts fail, then, as Bandura assumes, they will abandon their way of acting and seek another more favorable environment. Finally, when low self-efficacy is combined with an unfavorable environment, a person experiences apathy, is considered impotent and inclines to tolerate their position. For example, a small employee with low self-efficacy, who knows how difficult it is to become the president of the company, will feel indecisive, will not be able and will not be able to undertake any real attempt to achieve similar, but minor, objectives (Bandura, 1989a).

But although the views of self-efficacy have a powerful influence on one’s activities, it cannot be assumed that the behavior is determined solely by these concepts. Self-efficacy, together with the environment, previous behavior and other characteristics of the personality, among which their expectations about the results of their actions are particularly important, determine people’s current behavior. In a Group Model Building setting, stakeholders usually meet the issue of interpreting the problem from the perspective of their environment. In other words, the way one perceives the reality affects other’s view of the environment, through their (verbal or nonverbal) behavior (Vennix, 1996), and as a result stakeholders’ behavior can be determined by stakeholders’ self-efficacy, and Group model Building environment.

Clearly, it is not simply a matter of how capable one is, but of how capable one believes oneself to be. The idea is not only in believing of being capable in performing in a certain way, knowing how to do particular tasks, or on the contrary stick to the ones that mastered. In order to develop a strong sense of self-efficacy it is important to not be afraid of approaching new unfamiliar task, or deal with more complicated ones, “difficult tasks need to be attempted, and obstacles worked through” (Bandura, 1994). From this remark a strong link can be identified between self-efficacy and Group Model Building, called Task Complexity. Task complexity relates to whether a person notices complexity when being faced with a task, or expects complexity when approaching a task, so Task Complexity Awareness identifies whether a participant realizes how complex the task is (Andersson, 2015). A paper by Pia Andersson describes the impact of scaffolding of Task Complexity on actions and learning (Andersson, 2015), and explores how representatives from different organizations manage developing a solution to a challenging issue, having group process designed to scaffold increased Task Complexity Awareness. As a result, theories were considered and frameworks developed on adult development on the basis of conducted empirical research (Andersson, 2015). Since Task Complexity Awareness proved
to affect people’s perception of the issue they deal with (Andersson, 2015), and as Albert Bandura stated in his work that it is necessary to deal with more complex dilemmas in order to develop strong sense of self-efficacy (Bandura, 1994), it is fair to draw a conclusion that Task Complexity Awareness can be a source of self-efficacy, which is specific to Group Model Building process, and group setting in general.

From theoretical background on sources of self-efficacy it is seen that there is not much information available on this issue in the academic world, comparing to a huge list of papers about the effect generated by self-efficacy and which affects people’s daily life. Self-efficacy has generated research in areas as diverse as medicine (Schönfeld, Preusser, & Margraf, 2017), athletics, media studies, business, social (Katz-Navon & Erez, 2005) and political change, psychology, psychiatry, and education (Kool, Mainhard, Jaarsma, van Beukelen, & Brekelmans, 2017). In psychology, it has been the focus of studies on clinical problems such as phobias, depression, social skills, assertiveness, smoking behavior (Warner et al., 2018), and moral development. Self-efficacy has been especially prominent in studies of educational constructs such as academic achievement (de Blank, van Lamoen, & Lijnders, 2016), attributions of success and failure, goal setting, social comparisons, memory, problem solving, career development (Stajkovic & Luthans, 1998), and teaching and teacher education (Malmberg, Hagger, & Webster, 2013). In general, researchers have established that self-efficacy beliefs and behavior changes and outcomes are highly correlated, and that self-efficacy is an excellent predictor of behavior. Particularly, in psychology and education, self-efficacy has proven to be a more consistent predictor of behavioral outcomes than have any other motivational constructs (Sharma & Nasa, 2014). It is considered to be important to explore this literature gap represented on Figure 2, and investigate on papers which have more information about the identified constructs of the self-efficacy from Group Model Building perspective, whether these mentioned sources of self-efficacy linked with Group Model Building, so that this system dynamics approach could have a ground to manifest itself in the area of self-efficacy and possibly affect it. It is also decided to consider Task Complexity as a construct specific to Group Model Building of self-efficacy in the further literature selection.
3.4 Literature selection process: criteria

It is important to consider papers, which include one of the four sources of self-efficacy identified by Albert Bandura, which are next: Mastery Experience, Vicarious Experience, Verbal Persuasion, Emotional & Physiological States. In this study the Web of Science Core Collection is used as a data base and a search tool to find relevant papers from scientific journals, books, materials of scientific conferences. For systematic literature review it was decided to identify the following inclusion criteria:

1. Date, last five years, 2013-2018.

The papers before 2013 were excluded due to the logical fact that papers from last five years already have had a previous review undertaken that is being updated, which makes it unnecessary to go back over ground covered in the earlier review;

2. Language – English;

3. Quotation frequency – at least three times;
In the progress work it was noticed that due to expected limited amount of literature about targeted topics, there were very few papers with a proper citation frequency. Due to this reason the decision to consider papers even with no citation was taken. The largest citation frequency of one paper was 44 times.

4. Contains relevant keywords;

Since each source was considered separately in the search for connection with Group Model Building following keywords were used for specifying selection: **Source of self-efficacy** (Mastery Experience, Vicarious Experience, Verbal Persuasion, Emotional & Physiological States) accordingly, **Self-efficacy, Group, Effect**. The keyword “Group” limited the search to a group setting, which is an attribute for Group Model Building. Also, separate search with the same keywords was conducted for specific to Group Model Building newly identified source—Task Complexity.

5. Papers, which address immediate causes of self-efficacy; - Selected Manually.

6. Papers, which are relevant to group settings or environment with interpersonal cognition; - Selected Manually.

Problem description and visual reasoning and support for chosen criteria visually demonstrated on the provided below **Figure 3.** **Figure 3** shows the purpose of this systematic literature review - to find how Group Model Building approach can be represented and can manifest itself in each of the identified by Albert Bandura self-efficacy sources. Task Complexity Awareness is also visually represented in Figure 3 below since it has an impact on self-efficacy whether stakeholders will be feeling overwhelmed with tremendous amount of complicated information and hidden causal relations, they never knew before, and due to this reason can experience a change in their self-efficacy. Vice versa, the situation when the task might turn up even easier then participants would assume, will lift their self-efficacy.
3.5 Questionnaire as a Measure of Self-efficacy

Instrumentation

As was discussed before self-efficacy affects performance (Stajkovic & Luthans, 1998), and in order to affect the performance by the means of the self-efficacy we need to measure it and know the baseline. The only known and proved way to be effective way of measuring it is through a questionnaire (Denscombe, 2012) with the **General Self-Efficacy Scale**. Self-efficacy theory asserts that personal mastery expectations are the primary determinants of behavioral change. (Bandura, 2006) Further, it is suggested that individual differences in past experiences and attribution of success to skill or chance result in different levels of generalized self-efficacy expectations. To measure these generalized expectancies, a Self-efficacy Scale was developed (Schwarzer & Jerusalem, 1995). A factor analysis yielded two subscales: a General Self-efficacy subscale (17 items) and a Social Self-efficacy subscale (6 items). Confirmation of several predicted conceptual relationships between the Self-efficacy subscales and other personality measures (i.e., Locus of Control, Personal Control, Social Desirability, Ego Strength, Interpersonal Competence, and Self-esteem) provided evidence of construct validity. Target audience for the following scale are adults and adolescents. The scale is very...
widespread, used in various psychological tests and overall available in thirty different languages, the data collection format is pre/post self-report.

The following questions addressed (Schwarzer & Jerusalem, 1995):

1. I can always manage to solve difficult problems if I try hard enough.
2. If someone opposes me, I can find the means and ways to get what I want.
3. It is easy for me to stick to my aims and accomplish my goals.
4. I am confident that I could deal efficiently with unexpected events.
5. Thanks to my resourcefulness, I know how to handle unforeseen situations.
6. I can solve most problems if I invest the necessary effort.
7. I can remain calm when facing difficulties because I can rely on my coping abilities.
8. When I am confronted with a problem, I can usually find several solutions.
9. If I am in trouble, I can usually think of a solution.
10. I can usually handle whatever comes my way.

The participant uses the rating scale to sum up the score after answering all the questions. The range of the possible scores is from ten to forty points with different description of three identified assessment ranges, the score is more global assessment of participant’s self-efficacy, to get an idea how participant generally feel about their ability of handling situations successfully, whether the participant is more introverted or on the contrary generally takes actions with high hopes for success. The accepted and commonly used General Self-Efficacy Scale doesn’t show any connection to Group Model Building, though since from the literature review it is identified that Group Model Building has a linkage to self-efficacy, meaning that if so, then it can also be measured. This General Self-Efficacy Scale has been used in a great amount of studies with hundred thousands of participants, no alternative scale is nor developed nor suggested yet.
4. RESULTS

The overview of the number of papers harvested with the established connection of identified self-efficacy sources and group setting is demonstrated below in the Table 1.

<table>
<thead>
<tr>
<th>Source of Self-efficacy</th>
<th>Count of Authors</th>
<th>Sum of Citation Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mastery Experience</td>
<td>10</td>
<td>75</td>
</tr>
<tr>
<td>Physiological Indexes</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Social Persuasion</td>
<td>5</td>
<td>14</td>
</tr>
<tr>
<td>Task complexity</td>
<td>5</td>
<td>24</td>
</tr>
<tr>
<td>Vicarious Experience</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>29</strong></td>
<td><strong>130</strong></td>
</tr>
</tbody>
</table>

Table 1.

For Mastery Experience the following papers found to be relevant. (Table 2.)

<table>
<thead>
<tr>
<th>Literature found</th>
<th>Citation Frequency</th>
<th>Citation</th>
<th>Extracted Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>A systematic review of the intrapersonal correlates of motivational climate perceptions in sport and physical activity</td>
<td>44</td>
<td>(Harwood, Keegan, Smith, &amp; Raine, 2015)</td>
<td>Own Successful Attainment, Own Failed Endeavor</td>
</tr>
<tr>
<td>Teachers’ situation-specific mastery experiences: teacher, student group and lesson effects</td>
<td>12</td>
<td>(Malmberg et al., 2013)</td>
<td>Own Successful Attainment</td>
</tr>
<tr>
<td>Implementing the adapted physical education E-learning program into physical education teacher education program</td>
<td>6</td>
<td>(Kwon &amp; Block, 2017)</td>
<td>Own Successful Attainment, Competency</td>
</tr>
<tr>
<td>Effects of High- Fidelity Patient Simulation on Nursing Students' Resuscitation- Specific Self-Efficacy</td>
<td>4</td>
<td>(Roh, 2014)</td>
<td>Own Successful Attainment</td>
</tr>
<tr>
<td>Fostering positive experiences of group-based exercise classes after breast cancer: what do women have to say?</td>
<td>4</td>
<td>(Brunet &amp; St-Aubin, 2016)</td>
<td>Own Successful Attainment</td>
</tr>
<tr>
<td>Impact of an electronic monitoring device and behavioral feedback on adherence to multiple sclerosis therapies in youth: results of a randomized trial</td>
<td>2</td>
<td>(Yeh et al., 2017)</td>
<td>Own Successful Attainment, Own Failed Endeavor</td>
</tr>
<tr>
<td>Effects of an integrated simulation-based resuscitation skills training with clinical practicum on mastery learning and self-efficacy in nursing students</td>
<td>2</td>
<td>(Roh, Lim, &amp; Barry Issenberg, 2016)</td>
<td>Own Successful Attainment, Competency</td>
</tr>
<tr>
<td>Mastery and exercise play interventions: motor skill development and verbal recall of children with and without disabilities</td>
<td>1</td>
<td>(Valentini, Pierosan, Rudisill, &amp; Hastie, 2017)</td>
<td>Own Successful Attainment</td>
</tr>
<tr>
<td>Effects of honours programme participation in higher education: a propensity score matching approach</td>
<td>0</td>
<td>(Kool et al., 2017)</td>
<td>Own Successful Attainment, Own Failed Endeavor</td>
</tr>
</tbody>
</table>
The Effects of Utilizing High Element Ropes Courses as a Treatment Intervention on Self-Efficacy

Table 2. Source of self-efficacy: Mastery Experience

For Vicarious Experience next literature found to be suitable. (Table 3.)

<table>
<thead>
<tr>
<th>Literature found</th>
<th>Citation Frequency</th>
<th>Citation</th>
<th>Extracted Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementing the adapted physical education E-learning program into physical education teacher education program</td>
<td>6</td>
<td>(Kwon &amp; Block, 2017)</td>
<td>Successful Attainment, Failed Endeavor</td>
</tr>
<tr>
<td>The Effects of Tailoring Knowledge Acquisition on Colorectal Cancer Screening Self-Efficacy</td>
<td>2</td>
<td>(Jerant, To, &amp; Franks, 2015)</td>
<td>Successful Attainment</td>
</tr>
<tr>
<td>The Effects of Utilizing High Element Ropes Courses as a Treatment Intervention on Self-Efficacy</td>
<td>0</td>
<td>(Cordle et al., 2016)</td>
<td>Successful Attainment, Failed Endeavor</td>
</tr>
</tbody>
</table>

Table 3. Source of self-efficacy: Vicarious Experience

Literature found for Social Persuasion is shown in the Table 4.

<table>
<thead>
<tr>
<th>Literature found</th>
<th>Citation Frequency</th>
<th>Citation</th>
<th>Extracted Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementing the adapted physical education E-learning program into physical education teacher education program</td>
<td>6</td>
<td>(Kwon &amp; Block, 2017)</td>
<td>Encouragement, Support, Critique, Destructive Opinion</td>
</tr>
<tr>
<td>Organizational and knowledge management related antecedents of knowledge use: the moderating effect of ambiguity tolerance</td>
<td>5</td>
<td>(Ravindran &amp; Iyer, 2014)</td>
<td>Encouragement, Critique</td>
</tr>
<tr>
<td>A field examination of the moderating role of group trust in group efficacy formation</td>
<td>0</td>
<td>(Lee, Stajkovic, &amp; Sergent, 2016)</td>
<td>Encouragement, Critique</td>
</tr>
<tr>
<td>The Effects of Utilizing High Element Ropes Courses as a Treatment Intervention on Self-Efficacy</td>
<td>0</td>
<td>(Cordle et al., 2016)</td>
<td>Encouragement, Support, Critique</td>
</tr>
</tbody>
</table>

Table 4. Source of self-efficacy: Social Persuasion

Papers on Psychological Indexes, Emotional and Psychological States are presented in the Table 5.

<table>
<thead>
<tr>
<th>Literature found</th>
<th>Citation Frequency</th>
<th>Citation</th>
<th>Extracted Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavioural intervention to increase physical activity in adults with coronary heart disease in Jordan</td>
<td>2</td>
<td>(Alsaleh, Windle, &amp; Blake, 2016)</td>
<td>Anxiety, Stress, Readiness to Test the Ability</td>
</tr>
<tr>
<td>Effects of the Youth Fit 4 Life physical activity/nutrition protocol on body mass index, fitness and targeted social cognitive theory variables in 9-to 12-year-olds during after-school care</td>
<td>1</td>
<td>(Annesi, Walsh, Greenwood, Mareno, &amp; Unruh-Rewkowski, 2017)</td>
<td>Readiness to Test the Ability, Excitement, Anxiety</td>
</tr>
</tbody>
</table>
Effects of an after-school care-administered physical activity and nutrition protocol on body mass index, fitness levels, and targeted psychological factors in 5- to 8-year-olds

Effects of Yoga on Physiological Indices, Anxiety and Social Functioning in Multiple Sclerosis Patients: A Randomized Trial

<table>
<thead>
<tr>
<th>Literature found</th>
<th>Citation Frequency</th>
<th>Citation</th>
<th>Extracted Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examining the moderating effects of time on task and task complexity on the within person self-efficacy and performance relationship</td>
<td>9</td>
<td>(Beattie, Fakehy, &amp; Woodman, 2014)</td>
<td>Task Complexity Awareness, Expected Complexity</td>
</tr>
<tr>
<td>When feeling safe isn't enough: Contextualizing models of safety and learning in teams</td>
<td>8</td>
<td>(Sanner &amp; Bunderson, 2015)</td>
<td>Expected Complexity, Task Complexity</td>
</tr>
<tr>
<td>Capturing the complexity of malleable IT use: Adaptive structuration theory for individuals</td>
<td>4</td>
<td>(Schmitz, Teng, &amp; Webb, 2016)</td>
<td>Expected Complexity, Task Complexity</td>
</tr>
<tr>
<td>Are There Detrimental Effects From Proficiency-Based Training in Fundamentals of Laparoscopic Surgery Among Novices? An Exploration of Goal Theory</td>
<td>3</td>
<td>(Sanner et al., 2016)</td>
<td>Task Complexity, Expected Complexity</td>
</tr>
<tr>
<td>The Effect of Mixed American-Chinese Group Composition on Computer-Mediated Group Decision Making</td>
<td>0</td>
<td>(Li, Rau, &amp; Gavriel Salvendy, 2014)</td>
<td>Expected Complexity, Task Complexity</td>
</tr>
</tbody>
</table>

Table 5. Source of self-efficacy: Psychological Indexes

Last but not least, the following is applicable literature for specific to Group Model Building source of self-efficacy- Task Complexity Awareness. (Table 6.)

Drivers of self-efficacy are represented on Causal Loop Diagram provided in Figure 4, showing in which way main causes of self-efficacy can be considered from the Group Model Building perspective. The main sources of self-efficacy were identified by Bandura, and each of the four is adopted and considered from the Group Model Building perspective, whether particular cause can or cannot take a place in Group Model Building technique. Task Complexity Awareness as the construct of self-efficacy unique to Group Model Building is also considered and represented on the Causal Loop Diagram below.
Figure 4. Causal Loop Diagram of self-efficacy sources in Group Model Building.

The presented Causal Loop Diagram makes it possible to visualize whether there is a possibility for the identified construct of self-efficacy to be a driver of certain nature of self-efficacy particularly in Group Model Building.

The present findings suggest that for each source of self-efficacy, there are variables which take a place in Group Model Building sessions.

Vicarious Experience in Group Model Building affects self-efficacy in two ways: first is when seeing Failed Endeavor of others decreases self-efficacy of the participant, “one participant remarked on the course that no one else in the group had been successful on a certain element, and that he chose not to attempt the element as a result” (Cordle et al., 2016). The second way Vicarious Experience manifests itself in Group Model Building, when Successful Attainment of others increases self-efficacy of the stakeholder. Online training on implementing the adapted physical education E-learning program into physical education teacher program proved to be more successful, when teachers were watching someone else successfully include students with disabilities in GPE (Kwon & Block, 2017), so the participants by watching each other succeeding in some tasks during Group Model Building sessions, will believe in their
own abilities to have a similar outcome in such task during the sessions, and the daily tasks as well.

Next source of self-efficacy, Social Persuasion, from Group Model Building Perspective has following influence on self-efficacy: more Encouragement, Support during Group Model Building sessions results in more self-efficacy. It is proven, that groups with intragroup encouragement have stronger group efficacy beliefs and perform more effectively compared with groups that lack such support (Lee et al., 2016). The next variable represented on Figure 4 Critique/Destructive Opinion also demonstrates how this source of self-efficacy may be represented in Group Model Building. More Critique/Destructive Opinion discourages another person to share his ideas, so the self-efficacy of such participant decreases (Ravindran & Iyer, 2014).

The source of change in self-efficacy as Physiological Indexes, which expresses the physical and emotional state of a person is demonstrated on the Causal Loop Diagram (Figure 4) through following variables: Anxiety, Stress and Excitement and Readiness to Test the Ability. When a person experiences severe fear, acute anxiety or is in a state of stress, his self-efficacy is reduced (Hasanpour-Dehkordi, 2016). In clinical trial study, it was found that Excitement and Readiness to Test the Ability is likely to increase self-efficacy of patients (Alsaleh et al., 2016). As these variables are not explicit in Group Model Building it is fair to mention them on the Causal Loop Diagram, without direct connection to self-efficacy.

Success, achieved independently, has a greater impact than what is done with outside help (Razieh Tadayon Nabavi, 2016). On the Causal Loop Diagram (Figure 4) Mastery Experience source of self-efficacy is represented through the Actual Performances variable, two possible outcomes are considered Own Successful Attainment and Own Failed Endeavor. The more Own Successful Attainment in the past, the more the stakeholder believes he can achieve the same result in the specific Group Model Building task. Experience with Own Failed Endeavor leads to decrease in self-efficacy, because past failure undermines personal efficacy (Malmberg et al., 2013). People’s beliefs and perceptions of their practice, when they already have a solid idea of their own competency has an influence on Expected Complexity of the specific task (Kool et al., 2017). The variable Expected Complexity found to be linked to Task Complexity Awareness, in a directly proportional relationship, the more Expected Complexity, the more a stakeholder aware of Task Complexity. Task Complexity Awareness found to be a specific to Group Model Building self-efficacy construct, from Group Model Building perspective (Andersson, 2015). As it can be seen from the demonstrated Causal Loop Diagram
(Figure 4), Structuredness of Available Information, which stakeholders get due to Group Model Building (Andersson, 2015) increases Knowledge of High Leverage Points and Task Complexity Awareness, and since participants build shared understanding of the problem, it increases the effect on self-efficacy. There are variables on the map (Figure 4), such as Amount of New Information to Process after GMB, and Amount of Known Information before GMB (Group Model Building) have a different influence on Task Complexity and Knowledge of High Leverage Points. It can be seen that due to these factors the stakeholders can be overwhelmed by the amount of information they realize due to Group Model Building, and it can decrease their self-efficacy since the issue will be perceived as too complicated to handle. On the contrary, when a stakeholder has a little Amount of New Information after Group Model Building, and due to Structuredness of Available Information the picture of the problem becomes clearer to stakeholders, and this increases their self-efficacy.

5. DISCUSSION

5.1 Managerial and Theoretical Implications

From the research it is determined that Group Model Building affects self-efficacy almost in all of the identified by Albert Bandura sources, represented on the Causal Loop Diagram (Figure 4) though, emotional and psychological state does not have a strong link to self-efficacy, when considered from Group Model Building perspective. As it was mentioned, for this reason it is not connected to the rest of the map, though it is important to demonstrate it as well.

An innovative aspect of this study is that now, there is some literature identified for further research in the qualitative way where the connection between Group Model Building and self-efficacy is established and demonstrated on Causal Loop Diagram. To my knowledge, up until now sources of self-efficacy have never been studied from Group Model Building perspective. Performing qualitative research by conducting a systematic review made it possible to gain a more in-depth view on how Group Model Building can affect self-efficacy. Task Complexity Awareness is now also defined as construct which has a huge impact on self-efficacy of the stakeholders during Group Model Building. Furthermore, this systematic literature review made it possible to gain more information about relevant aspects, which play a role in each of
the sources of self-efficacy. Identified aspects are demonstrated on the Causal Loop Diagram (Figure 4) to visually understand the current situation in academic literature about this topic. It can also be seen that this field needs to be studied further and that there is a big gap of literature about the drivers of self-efficacy, and what causes the changes in it. More research on this topic can be valuable because impacts on self-efficacy lead to more knowledge on what causes change in self-efficacy and if there are any ways to achieve the desired behaviour due to managing self-efficacy.

Managerial and Theoretical Implications – advices for facilitators to use Group Model Building’s impact on sources of self-efficacy to improve it. For example, they can use Mastery Experience and demonstrate how the stakeholders could tackle a task during Group Model Building session and being a role-model in a task or discussed situation. Another example would be to focus on enhancing self-efficacy during Group Model Building session through Vicarious Experience, and maybe develop a new script for using in Group Model Building workshops, where the session is built in such a way, that the participants could observe each other or another group successfully overcoming similar tasks. Facilitators are also advised to work with Task Complexity Awareness construct of self-efficacy and look for the ways how to use this knowledge to avoid the stakeholders from having an overwhelmed feeling when they would realize the complexity of their issue. This report will be valuable to participants of the Group Model Building session as well, since the participants could also benefit from the insights provided in this research and which highlight how they can work on their self-efficacy and be prepared to face unexpected task complexity they were not aware of. Further research is needed, to develop and further test the task specific questionnaire, based on General Self-Efficacy Scale, which will give more information on how stakeholders perceive themselves and give needed insights for facilitators to understand how to use their knowledge about self-efficacy during Group Model Building sessions.

5.2 Synthesis of Identified Sources with Group Model Building Intervention Method

A task specific questionnaire will help to gather further information on how identified sources can be measured during Group Model Building sessions and will also help to get a better understanding of how important each of the sources is from Group Model Building perspective.
Task specific questionnaire can be build up on and be addition to General Self-efficacy Scale (Schwarzer & Jerusalem, 1995), and measured accordingly, using the same scale. The following suggested questions are adapted from the Group Model Building questionnaire by Vincent de Gooyert (De Gooyert, 2017).

The following questions can be included in the task specific questionnaire:

- The task of (fill in the context task) is a complex task because
  1. There are many things to look at
  2. There are too many stakeholders with conflicting opinions
  3. Too many opinions that complicate my understanding of the task
  4. There are many mutual relationships between the various aspects of (tailored to the context)
  5. Specific background knowledge is required to solve the task
  6. The task is completely new, I have never encountered something like that

- Identify to what extent you agree with the following statements
  1. I am certain that I am capable of improving the main aspects of (tailored to the context)
  2. I am able to achieve the major improvement when it comes to dealing with the main aspects of (tailored to the context)
  3. I am certain I have enough knowledge/competency to deal with such a task
  4. My colleagues see me as someone capable of working on the main aspects of (tailored to the context)

- Identify to what extent you agree with the following statements
  1. I have in mind how I can improve the main aspects of (tailored to the context)
  2. I know what resources are effective when it comes to dealing with the main aspects of (tailored to the context)
  3. I know how to use the knowledge/competency I have in order to deal with such a task
  4. I know how to successfully complete my role when it comes to working on the main aspects of (tailored to the context)
6. CONCLUSION

The conducted research gives an attempt is to find the links between Group Model Building and the sources of self-efficacy in order to explore how Group Model Building affects self-efficacy. Generally accepted and identified by Albert Bandura self-efficacy constructs were considered from a Group Model Building perspective. New insights specific to Group Model Building were introduced as the sources of self-efficacy, such as Task Complexity, and the overall situation is visually represented on a Causal Loop Diagram. As Group Model Building generally claims to increase performance, and self-efficacy seems to be one of the variables that plays a role in the expectation that Group Model Building improves performance, however results of Group Model Building on performance are mixed and some projects still fail. The reason for diverse outcomes could be that Group Model Building differently influences self-efficacy and the participants might feel overwhelmed with the process amount of information they feel they are not ready to deal with. Therefore, task specific questionnaire was suggested for further use and more research is needed to be done on how Group Model Building affects self-efficacy, in order to avoid the potential negative influence and to strengthen the potential positive influences. This research successfully opens a new perspective to explore the field of Group Model building and self-efficacy.

7. LIMITATIONS AND FURTHER RESEARCH

7.1 Limitations of the Research

A limitation of this research paper would be the fact that no interviews were conducted in order to investigate and measure self-efficacy of stakeholders in ongoing Group Model Building sessions. It would be very informative and helpful to measure pre/post self-efficacy reports of participants using adopted and task specific self-efficacy scale to identify the change in self-efficacy of stakeholders, by comparing their self-reports at the very first Group Model Building session and the one from the final session.

Another limitation of this research that rhetorical reckoning was not considered between Albert Bandura and Jeffrey B. Vancouver. There is a debate between two known psychologists Albert Bandura and Jeffrey B. Vancouver, where they consider two different theories, and criticize one another. The latter one proposes that computational modeling and logical reasoning are presented as an alternative approach (Vancouver, 2012) for better critique and theoretical
theorizing. In his other recent work (Vancouver & Purl, 2017) Vancouver and Purl try to provide more clarity to the theoretical arguments, and strives to explain the negative self-efficacy effect observed in some recent studies. The reason why his papers were not considered in the literature review of this research, though Vancouver talks about computational models and seems to explore modeling possibilities in organizational psychology, he doesn’t provide any information on the possible sources of self-efficacy, or its constructs. Since the main purpose of this Master thesis is to investigate how Group Model Building affects self-efficacy, and not the effects of self-efficacy, it was decided to leave Jeffrey Vancouver’s research out of this study, though it is very important to mention his great contribution to the field. This research based mainly of Albert Bandura’s previous research and his identified constructs of self-efficacy, because no other researcher proposed the sources of self-efficacy.

7.2 Further Research

Suggestions for further research on how Group Model Building can affect self-efficacy is to conduct interviews with the task specific self-efficacy questionnaire, the measurement needs to be done both a pre- and post- sessions to fully understand and monitor the process of change of self-efficacy of the stakeholders. By obtaining such in-depth information of the change of self-efficacy, impact of Group Model Building will be identified clearer. In order to conduct such a process, task specific self-efficacy questionnaire needs to be tested in ongoing Group Model Building project.
REFERENCE


De Gooyert, V. (2016). Nothing so practical as a good theory; Five ways to use system dynamics for theoretical contributions. *34th International Conference of the System Dynamics Society, 1–10.*


Omisore, B. O. (2014). Organizational Conflicts : Causes , Effects and Remedies, 3(6), 118–137.


