

Original research article

# Five innovation energy mechanisms need strategic and operational HRM involvement—An abductive case study at Saxion University of Applied Sciences in the Netherlands

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**Abstract:** This paper provides insight into innovation energy, its five working mechanisms and innovative work behaviour (IWB). Although human energy is often mentioned as an important factor in theories about motivation, it still is an unexplored theme in literature. The management in organisations often focus on the innovation content and neglect the process aspects. Strategic and operational HRM involvement is needed for realising the essential conditions for the innovation energy of innovative employees. An abductive case study on innovation energy took place in five educational departments of one academy at Saxion University of Applied Sciences in the Netherlands. We interviewed 21 innovating lecturers and their five team leaders individually and organised five focus groups with in total 17 team members. Innovation energy converts individual innovation properties (creativity, psychological empowerment and optimism) into IWB. Organisations must pay attention to these properties and four other working mechanisms (autonomy, teamwork, leadership and external contacts) which influence this conversion process. HRM professionals should be involved with innovation processes to realise the right conditions for innovation energy together with the line management. The construct of innovation energy with five working mechanisms gives more insight into the IWB process from the perspective of the engaged employee with IWB. This research contributes to the body of knowledge on IWB, (human) innovation energy and engagement in relation to HRM.

**Keywords:** innovation energy; case study; engagement; innovation properties; abductive research; HRM

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## 1. Introduction

The corona crisis, global environmental problems, fossil fuel shortages, the and tensions in world politics as the Russian war in Ukraine, show how quickly companies must adapt to changing environments. Thanks to better transport possibilities and information technology business became more online and international with stricter customer requirements, price competition and shorter delivery times<sup>[1]</sup>. In addition to the growth perspective, it is becoming increasingly less socially and politically acceptable to pursue only huge profits. Increasing shareholder value may come at the expense of our living environment and happiness in life. The idea that sustainable investments only cost money has changed globally in the last decade, and it is remarkable that green and sustainable investments are growing<sup>[2]</sup>.

The need for innovation, using ideas supplied by both employees and customers, is growing urgent in many businesses<sup>[3,4]</sup>. Innovation is of vital importance for organisations, whereby it is becoming increasingly clear that the individual innovative employee has a key role to play in the innovation process<sup>[5]</sup>.

Innovative employees show innovative work behaviours (IWB) in socio-political organisational processes. They need facilitation by the right organisational context and management styles, which is not always the case<sup>[5-7]</sup>. Organisations, managers, employees, and teams often strive for stability and do not like innovation at all. Organisations have ingrained patterns, rules, norms, and values and are therefore institutionalised. This is one of the reasons that most innovations fail<sup>[8,9]</sup>.

Because of these kinds of processes, organisations need engaged employees with IWB who can deal with this kind of obstacles and strive for the renewal of products or processes.

In the literature about IWB, it seems that IWB is a result of choices of the organisational management. Diverse factors which influence IWB were identified, defined and hypothesised<sup>[10-16]</sup>. However, besides management effort, more attention is needed for IWB, being the result of the engaged employee itself showing this behaviour using an energetic power called innovation energy<sup>[17]</sup>. In our research we are not only interested in the influence of the environment on employees with IWB but also in the influence of these employees on their environment. As far to our understanding, this is an underexplored theme in the existing literature. Schippers and Hogenes<sup>[18]</sup> did a review on energy management literature and formulated the following questions for future research: “What personality variables are highly related to energy? Is there a combination of personality traits that is most strongly related to energy? How does energy flow through networks?”

The present case study gives insight into how innovation energy fulfils a conversion role between personal innovation properties, as the intra-personal mechanism, and showing IWB. Innovation energy is also related to four work-context mechanisms: autonomy work-design, having external contacts, innovative teamwork, and supportive leadership<sup>[17]</sup>.

The case study concerned radical innovative circumstances at Saxion University of Applied Science, a non-profit Dutch educational institution on bachelor level. A radical educational innovation is being developed and implemented under the name Saxion Education Vision (SEV). In this context, SEV fits within the strategic course of the organisation.

Teachers who develop and implement educational curricula in line with the SEV requirements must do so in a context of regulations and resistance from fellow teachers. We assumed that the lecturers who volunteered to lead this change, alongside their teaching position, must be employees with IWB. This new way of teaching can be seen as a radical innovation because teachers who were used to giving standard classroom lectures are being taken out of their comfort zone. In the new vision the student must develop a strong personal responsibility for their own professional growth.

Five educational departments of one academy Saxion was chosen for the case study because there is an active policy to develop and implement SEV.

Besides the innovation energy and its five working mechanisms, this article has a focus on the need for more strategic and operational HRM attention for the total IWB process. Managers often focus on the content of the innovation (the new product or service which leads to businesses opportunities) and neglect the change process aspects of the innovation<sup>[19,20]</sup>.

Ulrich<sup>[19]</sup> pointed out that there are widespread doubts about the contribution of HRM on the organisational performance and stated that a new mandate is necessary because HRM is needed now more than ever. To achieve organisational excellence in a competitive world, there must be a “focus on learning, quality,

teamwork, and reengineering, driven by the way organisations get things done and how they treat their people, which are fundamental HRM issues.” In this new mandate, HRM should be a partner of the management as “an agent of continuous transformation, shaping processes and a culture that together improve an organisation’s capacity for change”. Bos-Nehles et al.<sup>[10]</sup> reviewed HRM articles related to IWB and concluded that, “the best HRM practices for enhancing IWB are training and development, reward, job security, autonomy, task composition, job demand, and feedback.” In this article we will show that this mandate and HRM activities are necessary in the total IWB process.

First, we describe innovation energy and its five working mechanisms and explain how this energy converts personal innovation properties into IWB. For this we present data from the Saxion case. After outlining IWB and its mechanisms we shed more light which role HRM should have in this process. As a result of our data interpretation we point out that HRM is needed for more focus on the process side of innovations and the stimulation of more alignment between the strategic course of the organisation and the operational innovation process.

The research question based on the focus of this article is, “In what way can HRM stimulate the innovation energy and its working mechanisms of employees with IWB in the context of a radical innovation.”

## 2. Theory

### 2.1. Five working mechanisms of innovation energy

Employees with IWB have individual innovative properties like creativity<sup>[15,12]</sup>, psychological empowerment<sup>[16]</sup> and optimism<sup>[14]</sup> to be able to show this behaviour. They are influenced by the work-contextual factors: perceived room for autonomy<sup>[10]</sup>, innovative teamwork<sup>[7]</sup>, supportive leadership<sup>[6]</sup> and external innovation contacts<sup>[21]</sup>.

Between all these factors there is a mutual relation with the innovation energy of these employees. This innovation energy has a converting role in changing the individual innovation properties into IWB<sup>[17]</sup>. Dorenbosch<sup>[22]</sup> described four stages of IWB: problem recognition, idea generation, idea promotion and idea realisation. Scott and Bruce<sup>[23]</sup> stated that each stage requires different behaviours, and individuals with IWB may be involved in any combination of the desired behaviours.

There are five working mechanisms of innovation energy leading to IWB<sup>[17]</sup>.

Firstly, there is the individual mechanism, in which the person finds the energy within themselves that leads to IWB, with or without the other factors. The innovative personality properties (creativity, psychological empowerment and optimism) provide innovation energy with IWB as a result, and vice versa: the energy stimulates these personality traits.

Secondly, the autonomy mechanism, in which the energy creates and uses various levels of autonomy. Space for autonomy given by the organisation will stimulate innovation energy and thus IWB. The employee with the right innovation characteristics will help shape the environment by creating more space for autonomy if the organisation does not provide enough space.

Thirdly, the team mechanism, where the energy of the individual influences the collective team behaviour and vice versa. It is known that teams are not always innovative, they can also strive for the status quo and stability. If the team is also an innovative team, then the employee with IWB gives and receives innovation energy from this team and has more opportunities to deal with other working conditions that may be less stimulating.

Fourthly, the leadership mechanism, in which the innovation energy is influenced by leadership and, vice versa, also influences it. Supportive leadership gives the employee with IWB innovation energy. At the same time this innovation energy stimulates the leader to be supportive, for example in allocating sufficient autonomy, time and budget for the innovation work or convincing higher levels of management to give this employee the right innovation conditions.

Finally, the external mechanism, where the energy of the person influences the external stakeholders and vice versa. The employee with IWB is not a passive user of information from this outside world, but also influences this world with innovative ideas<sup>[17]</sup>.

In **Table 1**, IWB and the factors influencing it are defined as a summary of the theoretical basis for the mechanisms. Innovation energy is worked out in the next section, because this is the main theme for the case study and therefore needs a more extensive theoretical elaboration.

**Table 1.** Definition of IWB and its factors.

<b>Innovative work behaviour</b>	“IWB is all employee behaviour aimed at the generation, introduction and/or application (within a role, group or organisation) of ideas, processes, products or procedures, new and intended to benefit the relevant unit of adoption.” <sup>[1]</sup>
<b>Problem recognition</b>	Problem recognition is the first IWB stage, which involves a recognition of problems, different patterns or changing trends <sup>[24]</sup>
<b>Idea generation</b>	Idea generation is the second IWB stage, in which the problem recognition is transformed into solutions <sup>[24]</sup>
<b>Idea promotion</b>	Idea promotion is the third stage of IWB, which involves selling the ideas to and legitimising them for potential allies like managers, colleagues or clients <sup>[21,22]</sup>
<b>Idea realisation</b>	Idea realisation is the fourth stage of IWB, involving a result-oriented attitude, and the ideas must be put into practice in the form of products or services and adapted for organisational processes and procedures <sup>[11]</sup>
<b>Individual innovation properties</b>	Employees’ individual innovation properties are creative, empowering and optimistic individual characteristics needed for IWB <sup>[14–16]</sup>
<b>Creativity</b>	“Creativity is the production of novel and useful ideas by an individual or small group of individuals working together.” <sup>[15]</sup>
<b>Optimism</b>	“A generalized belief that good things will happen.” <sup>[25]</sup>
<b>Psychological empowerment</b>	“Psychological empowerment is a set of psychological states necessary for individuals to feel a sense of control in relation to their work.” <sup>[16]</sup>
<b>Perceived autonomy</b>	“The degree to which the job provides substantial freedom, independence, and discretion to the employee in scheduling the work and in determining the procedures to be used in carrying it out.” <sup>[26]</sup>
<b>Innovative teamwork</b>	The work of teams who are strongly engaged with team learning and team IWB. Sharing information and reflecting on team tasks and processes lead to engagement for developing and implementing new products and services. <sup>[27]</sup>
<b>External innovation contacts</b>	Contacts with stakeholders outside the own organisation that provide inspiration for innovation <sup>[21]</sup>
<b>Supportive leadership</b>	“Supporting leadership is the informational, instrumental and appraisal support for employees with a concern for their needs and well-being and facilitation of a desirable climate for interaction which encourages their psychological empowerment and development.” (Based on the combination of the definitions of Schyns et al., and Rafferty & Graffin <sup>[28,29]</sup>

## 2.2. Innovation energy

The literature distinguishes two related forms about the role of energy at work namely: organisational energy and human energy<sup>[30–32]</sup>, In the context of IWB, innovation energy refers to human energy.

Cross et al.<sup>[30]</sup> explained that in any organisation, there are energizers active (people who can spark progress in a project), while de-energizers mentally rehearse how they will cope with change processes. Employees with IWB are energizers using their innovation energy.

Quinn et al.<sup>[31]</sup> divided human energy into two main components. Physical energy is the “capacity to do work” (used and unused), and energetic activation is a “biobehavioural system of activation”. Quinn et al.<sup>[31]</sup> explained energetic activation as, “experiencing feelings of vitality, vigour, or enthusiasm. It can manifest itself in emotions (feelings with short duration targeted toward a specific object, event, or person), moods (longer-lasting, less-targeted feelings), or dispositions (enduring tendencies to be energetic or not).”

In our research, innovation energy is related to this energetic activation. Employees with IWB need this vitality, vigour and enthusiasm with which they can overcome several obstacles, as we described in the introduction. Schiuma et al.<sup>[32]</sup> defined individual energy as follows, “Individual energy is a complex result of multiple causes, which can be traced back to the fundamental laws affecting the conditions of well-being: the physical state, i.e., the body’s conditions; the cognitive state, i.e., the mind’s conditions; and emotional state, i.e., feelings, both conscious and unconscious.”

There is a relation between innovation energy and work engagement described by Schaufeli, Bakker & Salanova<sup>[33]</sup>. They defined work engagement as, “A positive, fulfilling, work-related state of mind that is characterized by vigour, dedication, and absorption.” The vigour aspect in this definition is interesting because this is characterised by the authors as, “High levels of energy and mental resilience while working”. We concluded from this definition of engagement and vigour that if an employee has an elevated level of vigour, she/he also has an elevated level of energy. Schaufeli and Bakker<sup>[34]</sup> explained that work engagement is, “The psychological state that accompanies the behavioural investment of individual energy”. Thus, engagement is not the energy itself, it involves using the energy for activities to achieve the organisation’s purposes.

Because the complexity of innovation processes and influences of five mechanisms we see the employee with innovation energy as a “spider in the web” creating balance with a focus on reaching successfully the innovation goals. After two cases studies and this theoretical exploration is innovation energy is defined as follows:

“Innovation energy is a stimulus converting employees’ innovation properties into IWB in a mutual dependency with the work context and the innovation properties.”

Innovation energy distinguishes itself from general human energy because the employee, influenced by his/her nature and/or life experiences as the nurture history, is passionate for using this energy in change processes. Without innovation energy, nothing will happen; it must be present to light the innovation fire.

## 3. Method

### 3.1. General

This research has an exploratory nature and uses an abductive approach. Through in-depth interviews we gained more insight into the five mechanisms, the converting role of innovation energy and employees showing IWB. This is not possible with quantitative research at this stage as much exploration is still needed to develop a theory of the new construct of innovation energy<sup>[35]</sup>. Our research goal was to contribute to the innovation literature by theorising on the innovation energy construct and the working mechanisms. In this article we also provide a better insight into the role of HRM and line management in creating the right stimulating circumstances for IWB. Saetre and Van De Ven<sup>[36]</sup> proposed that theory generation by abductive reasoning is not a “single flash of inspiration” but a useful systematic method that “may reoccur to make sense of complex

phenomena: observe and confirm an anomaly.” The five mechanisms as a theoretical framework gave direction and insight into the possible variables, and at the same time, our approach was open enough to new findings<sup>[35,36]</sup>. An interview protocol had been drawn up and was used in an in-depth interview format. The questions functioned as a topic reminder for the interviewer, when the interviewer invited the interviewees to speak freely.

### 3.2. Sampling

The interviews were held with 21 individual lecturers who are actively involved in the development and implementation of SEV (and are therefore expected to show IWB), their five managers and in total 17 team members of these employees in five focus groups. The focus groups consisted of 3 to 5 randomly selected team members of the interviewees who were actively working in the new educational system. The sample of 21 lecturers was based on the recommendations of their team leaders. Participation was voluntary. There was a variation in respondent features like gender, career experience and age. The interviews lasted an average span of one hour. The total number of respondents was based on the data saturation level.

### 3.3. Data analysis

In this section, we give two examples of questions in **Table 2**, the quote the respondent gave and how this was coded.

**Table 2.** Three examples of questions, answers and codes of case study three interviews with employees with expected IWB.

<b>Question about IWB</b>	What role do you have in the introduction of the SEV education model? Continue to ask whether it concerns problem recognition, idea generation, idea promotion, idea realisation.
<b>Respondent 2-1</b>	“I am therefore currently part of a project team that is involved in the development of the propaedeutic phase. We do try to walk continue outside the lines and want at the same time to understand the colleagues and everyone every time, so to create support in that way, so I’m certainly working on that. I have to say.”
<b>Codes</b>	IWB: idea promotion, creativity: creative thinking skills, autonomy high.
<b>Questions about individual Mechanism</b>	What personal characteristics and skills do you have that make you a project leader at SEV? (Continue to ask questions about the main dimensions of creativity, empowerment and optimism (questions about subdimensions were not necessary, have been sufficiently discussed in previous case studies, but subdimensions can be coded).
<b>Respondent 2-2</b>	“I often choose a different angle to problems than my colleagues and students. That is an energy that goes back and forth, a power that takes place. And if people oppose you, hold your breath for a moment and come back to it later. That’s how the energy stays.”
<b>Codes</b>	Creativity: creative thinking skills, IWB: idea generation, idea promotion, solving problems gives energy.

ATLAS.ti 9 was used for coding and analysing the transcripts. To select usable quotes for the answering the research question and archiving the case study goal, a selective coding of the open and axial codes took place. Variables of the five mechanisms were theoretically coded. Inductively identified meaningful statements about the relationships between the theoretically coded variables and IWB were open coded.

After the results about the relation between innovation energy and the four work context mechanisms again became transparent, just as in former two case studies, the importance of more attention for the innovation process was evident. In the abductive systematic combining method of Dubois and Gadde<sup>[37,38]</sup>, which we used, there is a matching phase. Which means that the results are confronted with the theory which can give a redirection to the research. In this matching and redirection process the connection was made with



the need for more strategic and operational attention of HRM in the total IWB process. This new insight is further elaborated in the discussion part of this article.

## 4. Findings

All 21 individually interviewed lecturers play an innovative role in developing new curricula based on the new educational vision of Saxion in the five educational departments. They quoted one or more of the four stages of Dorenbosch et al.<sup>[22]</sup> 113 times. The most quotes (40) involved the promotion stage. This is not surprising as some of their colleagues must break down their work into operational teaching programs and have shown resistance against the change process, as we will discuss in the next sections. Idea generation was the next most mentioned stage (33). This seems logical because that was exactly the task these innovators were given as project leader or project team member. They had to generate ideas and construct a bridge between vision and reality. The problem recognition stage was not mentioned much (19) because the innovators see problems as interesting obstacles and immediately start with idea generation. Idea realisation was also not much mentioned (21), which is explainable because this is the task of their operational colleagues. See **Table 3**. Three respondents quoted all four stages.

**Table 3.** Number of quotes of every IWB stage.

Team	Number of interviews	Problem recognition	Idea generation	Idea promotion	Idea realisation	Total
1	6	8	11	7	5	31
2	5	6	10	10	11	37
3	4	1	5	9	2	17
4	3	2	2	5	1	10
5	3	2	5	9	2	18
Totals	21	19	33	40	21	113

We will now demonstrate the findings about the five mechanisms in relation to innovation energy. Behind the quotes you will find a respondent code, because of the privacy no names. For example, the code 1-4 means that it is a quote of respondent number four from educational department one; the code 2-F that it is a quote of a focus group member of educational department two; and the code 1M that it is a quote of the team leader of educational department one.

### 4.1. The individual mechanism

Individual mechanism is the one in which the person finds the energy within themselves that leads to IWB, with or without the work-context factors. The innovative personality properties (creativity, psychological empowerment and optimism) provide innovation energy with IWB as a result, and vice versa, the energy stimulates these personality traits. What follows are the findings of the three personal properties belonging to the individual mechanism.

#### 4.1.1. Creativity

All innovators quote about their high task motivation. A majority of the 21 innovators stated that they have creative thinking skills. Innovation energy is stimulated by creativity, and in turn, creativity is stimulated by innovation energy.

“Part of my innovative creative mindset has to do with how you are as a person. Look, some people fit an innovation role very well and others don’t, right? So, I have something of quick solutions and possibilities for

problems.” (2-3); “When I am in the right energy, I become even more creative. If the feeling is positive, then I will do things like that.” (1-4).

The creative innovator who doesn't like implementation activities with much details sometimes works together with the innovators who like to do these activities. One creative innovator was interviewed just before leaving the organisation for another job because he felt that he was inhibited in his creativity by his tasks being too detailed. The innovators who in their opinion have no creative thinking skills mostly mentioned that their creativity was based on being open to the creative ideas of others and enjoying making their sometimes “wild ideas” useful for daily practice. “That first part of an innovation: producing ideas and producing solutions, which is what works for me and that goes super-fast and that last part about executing that goes well too. But that part in between where you must develop it, so that it is an exercise, a lesson or becomes a product. That is my big challenge and I need help from colleagues for that, that takes a lot of energy and there are other people who are much better at that than I am.” (2-4); “My fellow project group member comes up with completely different things that I would never have thought of, which need to be structured by me.” (2-1).

#### **4.1.2. Psychological empowerment**

The innovators mentioned examples of the stimulation of innovation energy by their psychological empowerment, and vice versa, psychological empowerment was stimulated by their innovation energy. “If it is the case that the energy input I provide produces no results, then I make sure that no major energy loss occurs with me, and I quit. I want to have complete control of my own autonomy and freedom. The other way around, when you feel positive energy, my light will turn on.” (1-3); “The fact that I see myself as innovative means that I produce my own ideas fairly independently. And sometimes having to kick a bit against what is handed to me and think about the way things can be done in an unusual way. That is fun.” (4-1).

Some innovators voiced that they hold back the energy connected with their psychological empowerment to give enough space for their fellow innovators or other colleagues. And some of them pointed out that it is not wise to have too many project members with this kind of energetic psychological empowerment power in one team. “You can't have a lot of people with that innovation energy in a team, I think that in a team there is a certain capacity for that.” (2-4); “In the past I was often speaking in a group for a long time, and I was very convinced of my own vision with less room for the vision of others. Now I know that the energy in groups grows if I give others space as well.” (1-3).

#### **4.1.3. Optimism**

Most of the innovators typed themselves as optimistic, with some of them being open to listening to more pessimistic colleagues or colleagues with resistance against the change process. Some of them even get energy from dealing with resistance. Innovation energy stimulated optimism, and vice versa, optimism stimulated innovation energy.

“I am someone who actually always sees it more positively. Whether it concerns private life or work? I also see challenges in getting over negative things and only highlighting positive aspects. So, I'm just an incredibly positive person by nature.” (2-5); “I had some great conversations this morning. These gave me back energy. So yes, you need each other, you can influence each other positively, and yes, negatively is also possible, but you can also help if someone is negative, another person can help you to be able to move forward.” (1-4).

#### **4.2. The autonomy mechanism**

All innovators need autonomy for their innovation work, to stimulate their creativity or to connect the creativity of others into a usable educational method. But a high amount of psychological empowerment would



make it impossible for them to do their job in circumstances with less freedom. “With innovation you need a lot of autonomy. Without autonomy, you cannot innovate, I cannot put my ideas in a format.” (1-5).

At the same time a majority wanted to have more clarity about the boundaries of their freedom. One of the respondents summarised this wish in one clear metaphorical quote: “I like to play in the sandbox, but I want to know where the edges are.” (2-4).

And if an innovator uses the autonomic space in an energetic way, they may be given more autonomy, as one team leader quoted, “When I notice that colleagues feel the space to discover and assess things, it gives me energy. I also see that not everyone can do that. I ask this type of highly creative person how this will contribute to good education. Then I ask for their timeline to work it out, if they can indicate that, that is also concrete enough for me.” (5M).

### **4.3. The team mechanism**

We held five focus group interviews to get insight into the role of the innovation energy interaction between the project teams and their colleagues. They operationalise the innovations in concrete lecture programmes and/or must use these programmes in practice. We noticed a highly energetic process within the project teams, but not always between the project teams and other colleagues. Focus group members have a great respect for their innovative work, but for real commitment, some of them wanted to be more involved. At the same time, they did not know where to find time for this involvement and were glad that their colleagues could do this innovative work for them, so there were mixed feelings and therefore a mixed energy transfer. Some quotes from the five focus groups, “And what I personally like very much about the project leader, even though this person has little time, that if I have a minor question, she makes sure she has time for me right away. And that gives me energy to go on and help them.” (1F); “I don’t know if I would be the most appropriate person to think about SEV right now, but I would at least like to be kept a little better informed by the projectteam, because I have no idea what they are doing.” (2F); “You have to overcome that resistance, then it helps if you can think along with your colleagues with the change, which gives energy.” (3F); “Yes, you get energy from a development day, but you also lose energy because you are constantly paying attention to what the other person is saying.” (4F); “Innovation gives me a lot of energy, especially because we are a very diverse group. So, we are also critical of each other and of the subjects and we consult me, and we divide the tasks. .” (5F).

### **4.4. The leadership mechanism**

The five managers of the departments in which the innovators work have a difficult job. They have a transformational leadership attitude<sup>[6]</sup> and do their job in a facilitating way by setting up the project teams with the, in their opinion, appropriate members. They are trying to get enough budget for the transformation and supporting the project team in their “promotional role”. Their job is difficult because they have to deal with a lot of activities outside their primary responsibility of managing their teams, which number about 40 employees.

What stood out in the results was the intensive energy interaction between the project teams and focus group respondents and their managers. Sometimes the energy gets a positive boost, and sometimes it decreases because the manager does not have enough time to pay close attention to the process. Some respondents felt that the entire process is driven by educational motivation, with which they agree, but there was no step-by-step project plan with clearly divided responsibilities and budget. Some respondents felt that a structural organisation-wide communication was missing that is needed to create and maintain an integral commitment with the innovation.

Some quotes of innovators who got energy from their team leader, “I experience a good energy balance between us with the team leader. When developing SEV, we experience good mutual energy, regardless of whether it will all work out.” (4-1); “What is very helpful is that our team leader is positive, that the team leader has a lot of energy for the plan, but is giving us a lot of space and that she also listens to those who are a bit more critical.”

Some quotes of innovators who did not get energy from their team leader, “It is very unclear what my exact assignment actually is, that costs me energy.” (4-1); “I don’t feel that I inspire my manager often, and if I do, this was not communicated with me.” (2-3).

Some quotes of team leaders who got energy from the innovators, “I look, so to speak, at the spark in their eyes. I don’t know if you should call that energy, but yes, it is. Then there is a kind of interaction whereby you both become increasingly enthusiastic.” (3M); “My flame is also lit by the work of the project group members, such as when I hear that one of the people who is now developing such a hot theme is also going to develop it further. He is still a relatively young lecturer, and I am now also giving him space.” (4M).

Some quotes of team leaders who did not get energy from the innovators or organisation, “And what costs me energy is that I have to work with groups of people who sit and talk for a long time with very little result in my experience actually.” (4M); “I would prefer if the organisation expressed a little more confidence and belief in my professionalism and expertise. With all those frameworks they give us a signal that we do not really trust you, and with that they take away energy, this undermines professionalism.” (3M).

#### **4.5. The external mechanism**

Without exception the innovators voiced that having external contacts is important for their IWB. They get inspired by other universities of applied science through knowledge sharing and hearing about how they dealt with obstacles. They like to hear expectations from the work field where students will work in the future.

“Input from outside the organisation is important for my creativity, including connecting all kinds of projects within and outside Saxion. If a student works for a client, that also can trigger something for educational innovation for me. Did it run well or not, for example.” (4-2); “Contacts with the outside world give me energy. Yes, if so, then you get a lot of added information and then I get all kinds of innovative ideas.” (2-5).

Students are also particularly important external contacts for the innovators; they are the clients of the organisation. By using the experience of the students in a co-creating way, the system improves. All the innovators mentioned the students as their most important energy source. The changes are implemented as co-creation. “And when I also see that the students have made really beautiful things, one really got a well-deserved top grade. I think it’s great they perform that well in this chaos. This really shows class. Yes, this gives me a lot of energy.” (1-1); “I find it much more fun doing those exercises with students anyway, and you also reach energy levels in that class, and you see people hooking up in ways that I don’t think you’re ever going to get done in a theory class.” (2-4)

### **5. Discussion**

With this case study our goal was not to prove the five-mechanism conceptualisation that resulted from two former case studies but the mechanisms were again recognisable. In this discussion we follow these mechanisms and connect the results with firstly the theoretical implications and secondly implications for the HRM practice whereafter we explain why the five innovation energy mechanisms need strategic and operational HRM involvement.

## 5.1. Theoretical implications

The research had as purpose to give a contribution to science by giving more insight to the IWB body of knowledge from the perspective of the employee where most theories use a managerial or organisational scope. Innovation energy and its five mechanisms gives this insight.

This deeper insight in the innovation energy is a gap in science, because human energy at work is an underexplored theme although it is mentioned in many motivational theories<sup>[18]</sup>. IWB is connected with the construct engagement. We explained in section 2.2. that innovation energy is needed for engagement in innovative work situations. With this connection therefore also, a contribution is given to the engagement body of knowledge. What now follows a theoretical exploration of the results.

### 5.1.1. Individual mechanism

The four stages of the IBW model of Dorenbosch et al.<sup>[22]</sup> were recognisable in the interviews. Only three of the innovators showed all four stages and the others, the others one or more stage. This is in accordance with the theory of Scott & Bruce<sup>[23]</sup> who concluded that individuals with IWB may be involved in any combination of the desired behaviours.

We found that the promotion stage was most evident present. Analysing the transcripts of the innovators and some of their colleagues, we noted the resistance of some colleagues against the change what they felt as a top-down decision.

The case study emphasised that the innovators of Saxion and their colleagues felt the lack of a company-wide, supported vision. These feelings led to the focus of the innovators on the promotion stage. The innovators used much of their innovation energy and empowerment to cope with the resistance process of colleagues. This resistance was not about the content of the innovation, as there was enough support for the new way of education. An energy-consuming factor was a disconnection between the autonomous way the professionals wanted to fulfill this new way of working and the strategic goals of the organisation. They wanted to have more co-production between all management levels and their engaged innovation activities, with more facilitation like getting time for this innovation in this radical process.

Agarwal<sup>[39]</sup> found that an alignment between the work of the innovators and the organisational goals is needed for their work engagement and IWB. Work engagement is described by this author as an essential state of the employee where it is important that “firms must find a way to create and sustain the level of energy and passion that people bring to work.” Trust influences work engagement and requires a psychological contract fulfillment and procedural and interactional justice. Communication with the employees about organisational policies and any changes are important for nurturing trust.

Lee<sup>[40]</sup> wrote that there must be a connection of the individual and team innovation process with the organisational strategy. Innovation can fail if the members become disappointed by a perceived misalignment between the central vision and goals and their own aspirations. This requires a leadership style which is technically based not only on educational principles, but also on the right process skills.

The research gave more insight into the process of converting innovation energy properties into IWB and the stimulation of these properties by innovation energy at the same time. The respondents stated that the energy stimulated their creativity, psychological empowerment and optimism, which were the individual innovation properties we formulated as part of the individual mechanism. And they expressed that this energy gave them an open mind and made them work harder and longer. This creative process did not stop at the end of the school day but continued in their leisure time, which can be viewed as a high task motivation, one of the features of creativity according to Amabile<sup>[15]</sup>.

The fact that we observed again a stimulating relation between the creative and psychological empowering employees' innovation properties and IWB is not surprising. The theories of Amabile<sup>[15]</sup> and Spreitzer<sup>[16]</sup> are well known and universally used in IWB research<sup>[12,21,24,41]</sup>.

We proposed that the personal feature "optimism" was important in relation to innovation energy. This was frequently mentioned by employees with IWB. The role of optimism as factor on IWB was noticed in science by Hsu et al.<sup>[42]</sup> as a moderating variable in the relation between creative self-efficacy and IWB and by Li and Wu<sup>[14]</sup> as a mediator factor in the relation between optimism and IWB. We interpreted out of our data that the stimulating relation of optimism on IWB can differ and is highly influenced by the converter innovation energy.

### **5.1.2. The autonomy mechanism**

About the autonomy mechanism we found that teachers are professionals who want to have a prominent level of autonomy in their work. At the same time, they also want clear boundaries for innovation like a project plan.

Autonomy is not about the strategy itself; that is the responsibility of the strategic management in their eyes. But within an organisation, the employee with IWB needs space for freedom, independence, and discretion in scheduling the work and determining the procedures<sup>[26]</sup>, especially concerning which methods they can use and the workplace<sup>[12]</sup>.

De Leede<sup>[43]</sup> argued that full autonomy is impossible because there is always an influencing environment. What is needed is a responsible autonomy, in which employees have a certain amount of freedom to do their job and take decisions and are asked to take responsibility and show commitment. An organisation with a high discretionary space is based on trust, and in an open communication, every participant loyally delivers his part of the job. This is possible as the entire organisational way of working but is also seen in an organisation with a low discretionary level if this low level is compensated by the managers who provide space for a two-way communication and trust.

### **5.1.3. The team mechanism**

The employees voiced that the team was very important for their IWB. There was a highly giving and getting innovation energy transfer within the project teams and between the project team and the members of the focus groups, who had respect for the work of their innovative colleagues. At the other hand the focus group members wanted to have more involvement with the innovation process.

Van De Ven<sup>[7]</sup> found that groups minimize internal conflict and go for consensus. "Groupthink" is not only an internal conformation pressure but also an external "outgroup" conflict. Sometimes groups are therefore unable to take creative ideas seriously. And the organisational structures support this with routine programs instead of the creation of a learning organisation. Bondarouk<sup>[44]</sup> studied the influence of experimental group learning on the successful or unsuccessful implementation of innovative IT technology and concluded that, "Group learning is a 'hidden' mechanism that may speed up, slow down, or even terminate an IT implementation project" If innovation is done in a project structure it is important that the management and HRM stimulate interaction between project team and their other colleagues in order to avoid that the project team becomes as innovation driven subculture and have later problems to get their colleagues motivated to accept the changes in their work processes.

#### **5.1.4. The leadership mechanism**

The team leaders exhibited a transformational and facilitating style but had so many other tasks beside this big radical innovation that they often could not find enough time to properly participate in their role. This resulted in that they sometimes give energy to the innovators and sometimes took energy from them. This outcome is related to the publication of Van Den Brand et al.<sup>[13]</sup>, who put forward the importance of the manager's transformational leadership skills for IWB on the individual and team levels. The environment must be informal, facilitating, and create room for experiments. The moments that the team leaders provided energy ensured progress with the projects.

Basically, we could observe that the team leaders, what we called the supportive manager, was not pushing their employees top-down in the direction of the organisational goals. They noted interesting innovative ideas of their employees with IWB and tried to connect them bottom-up with the existing strategic organisation goals to find time and money and be able to give their employees the autonomous space to work out the innovative ideas.

This managerial behaviour looks like the servant leadership style, which is a kind of transformational leader. Schippers & Hogenes<sup>[18]</sup>, proposed that recent research gives indications that servant leader have a focus on followers instead of the organisation and therefore, a good subject for future research on human energy.

Stone et al<sup>[45]</sup> posted that the purely transformational leader focuses on the organisation and tries to get commitment to the organisational objectives, while the servant leader with their focus on the followers see the organisation's goals as a subordinate result.

This is also the difference between the servant leader and the supportive manager. For the supportive leader, the organisational goals are not subordinate. They have knowledge that to make innovation successful time and a budget is needed. Of course, the employee as a person is important for the supportive leader, in conformance with the servant leader style, but together with the employee, there is a focus on realistic and feasible organisational goals. Our research pointed out that being a transformational supportive leader alone is not enough, the manager also needs time to be able to use this style.

#### **5.1.5. The external mechanism**

The innovators voiced that having extensive contact with the outside world, especially in national meetings about the new educational system, helps them in their creative idea-recognition phase. These meetings, together with meetings with the professional outside world and the students, gave the innovators an energy boost. The fact that the innovations were done in co-creation with the students gave an extra boost to the innovation energy.

Ngan summarizing the work of Kimberly & Evanisko<sup>[46]</sup>, asserted that engaging with external professionals fosters a culture of ongoing innovation adoption within the organisation. According to their research findings, they concluded that both internal and external interpersonal relationships and networks offer benefits for innovation within a company. These advantages manifest through open communication, the sharing of skills and expertise, and the cultivation of trust to mobilize resources and harness the creative potential of ideas and solutions.

The employees with IWB and also the focus group members voiced that co-creation with students gave them energy and also better innovations.

## 5.2. Practical HRM implications

The present case study emphasises the importance of the five mechanisms. Following these five mechanisms, we found the following implications for HRM practices:

Firstly, the individual mechanism. Knowing that the innovation properties of creativity, psychological empowerment and optimism are crucial innovation energy-giving and innovation energy-receiving factors, we advise using these properties as selection criteria in the recruitment process for innovative jobs.

Secondly, the autonomy mechanism. The employees need autonomy for the professional domain aspects of innovation, their creativity and space for their psychological empowerment of the innovation. At the same time the innovators need clear boundaries, a project organisation and facilitation like getting enough innovation time, to use their energy for the innovation itself.

Thirdly, the team mechanism. Given the fact that only a few employees with IWB were able to show all four phases and that creative innovators have other competences than more implementation-oriented innovators such as attention for details, job descriptions must be very precise about which kind of innovator is needed. Be sure that all competences are present in project teams.

Fourthly, the leadership mechanism. The case study shows that it is important that if an organisation starts a radical innovation, the operational leaders must be released from other organisational tasks so that they have enough time to support the process with a facilitating attitude. The facilitating leadership style is essential for a positive leadership mechanism for IWB. In the recruitment of managers who must lead innovation, this style should be a selection criterion. Finally, strategic HRM activities should create an alignment between the strategic goals and vision of the organisation and the innovation work of all management levels, project and other teams and the individual employees. With a collective purpose-driven culture, energy-consuming negotiations and promotion activities can be avoided.

Finally, the external mechanism. Give the employee with IWB time and a budget for starting and maintaining relevant external contacts. And stimulate co-creation of innovations with the clients, which leads to better innovations. This way of working is also an innovation energy-stimulating factor.

## 5.3. Conclusion

Radical innovation processes require employees with innovation energy. Innovation energy converts individual innovation properties (creativity, psychological empowerment and optimism) into IWB. In addition, four other working mechanisms characterises this conversion process, namely autonomy, teamwork, leadership and external contacts. All factors relate to each other in an energy-giving and -taking process. Engaged employees with IWB have the energy to persevere in this complex innovation process. HRM professionals must take an active strategic and operational role in the innovation process to stimulate the line management to pay attention to the innovation energy-stimulating factors. In the strategic role HRM cooperate with the top management of an organisation in developing and implementing an innovation strategy with attention for the human factor and based on an organisational broad purpose driven culture. HRM should be watching that the organisational structures and division of task are in a way developed that operational managers can have enough time and attention for innovation processes especially when the innovation is radical. And in the operational role HRM should stimulate the development of the right project structures which give room for autonomy within clear boundaries and is coaching the line management in their supportive leadership.

In the introduction we mentioned that Ulrich<sup>[19]</sup> stated that HRM needs a new mandate, especially in change processes. The HRM department could be a bridge to the line management, who often has to focus



more on the content of the change process than on the needs of the employees with IWB. Ulrich<sup>[19]</sup> stated that, “HRM should become a champion for employees, vigorously representing their concerns to senior management and at the same time working to increase employee contribution; that is, employees’ commitment to the organisation and their ability to deliver results.”

Kim et al.<sup>[20]</sup> concluded that job and personal resources influence engagement and that engagement influences job performance, but that a great number of leaders do not have sufficient knowledge about engagement and how to develop engaged employees. Our research contributes to this knowledge and gives line managers and HRM professionals more tools for creating the right innovation energy-facilitating circumstances.

The results and the theoretical implications indicate that it is very important at innovations and especially at radical innovations to have much attention for change management aspects next to the content of the innovation.

## 6. Research implications and limitations

There is not much literature about human energy in innovative work circumstances, we found only two useful research articles from Quinn et al. and Schiuma et al.<sup>[31,32]</sup>. We hope that other researchers pick up this abductive process to increase theorising about innovation energy for the HRM practice. We have some relevant suggestions.

More research is needed on other known influencing factors on IWB in relation to innovation energy like corporate and team culture. We know that the literature lists more factors than we used in our conceptualisation. We made the choice to use the ones mentioned most often in the specific IWB literature. We have already made a practical implication about the need for stimulation of a collective purpose-driven corporate culture. We also signaled a cultural influence on the team level. During the empirical research we observed that innovators who were law teachers had a much more step-by-step approach to innovation and are more risk-avoiding than innovators with a business administration background who like a challenge. The risk-avoiding approach leads to a smooth innovation process but with less creativity in contrast to the challenge approach, where we observed more difficulties in the process. Soomro and Shah<sup>[47]</sup> described a significant positive influence of corporate and team culture on the employee’s performance among other influences like organisational commitment and job satisfaction.

More research is needed on the role of employees without IWB in the innovation process. We did not research this aspect but had several quotes from innovators about the fact that there must not be too many innovators in a team. Not every employee necessarily has to excel in both exploration and exploitation. Renkema et al.<sup>[48]</sup> showed that bottom-up innovation is also possible in a highly formalised operational process. This requires a bottom-up linking pin role of the manager, encouraging systems (IT) for sharing innovative ideas and a clear project system. Are these the solutions for stimulating the growth of innovation energy under less innovative circumstances?

## Author contributions

Conceptualization, HJvE and JdL; methodology, HJvE; software, HJvE; validation, HJvE and JdL; formal analysis, HJvE; investigation, HJvE; resources, HJvE; data curation, HJvE; writing—original draft preparation, HJvE; writing—review and editing, HJvE and JdL; visualization, HJvE; supervision, JdL; project administration, HJvE. All authors have read and agreed to the published version of the manuscript.

## Conflict of interest

The authors declare no conflict of interest.

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