

## Students' Attributes of Movement Capability in Physical Activity: A Multiple Case Study

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**Abstract: Students' Attributes of Movement Capability in Physical Activity: A Multiple Case Study. Objectives:** The study aims to examine and explain the attributes of movement capability in the students' physical activity based on their lived experiences and perceptions. **Methods:** Multiple Case study design was used to emerge possible factors that can be attributed to the movement capability of the students. Eight cases were considered to provide the narratives on the attributes of movement capability. **Findings:** Using the Braun and Clarke's method of analysis, the findings reveal that the attribution of movement capability in physical activity is enclosed in the biological inheritance, movement affordance, peer influence, and internal motivation of the students. **Conclusion:** It is concluded that movement capability of an individual can be attributed to the different factors. In the context of physical education program, enhancing the students' capability in physical activity performance, the activity must be encouraging, challenging, enjoyable, and sociable to create positive and active students' participation.

**Keywords:** biological inheritance, internal motivation, movement affordance, physical activity.

**Abstrak: Atribut Kemampuan Gerak Siswa dalam Aktivitas Fisik: Suatu Studi Kasus Berganda.**

**Tujuan:** Penelitian ini bertujuan untuk mengkaji dan menjelaskan atribut kemampuan gerak dalam aktivitas fisik siswa berdasarkan pengalaman dan persepsi hidup mereka. **Metode:** Desain Studi Kasus Berganda digunakan untuk mengungkap faktor-faktor yang mungkin terkait dengan kemampuan gerak siswa. Delapan kasus dianggap memberikan narasi tentang atribut kemampuan gerak. **Temuan:** Dengan menggunakan metode analisis Braun dan Clarke, temuan mengungkapkan bahwa atribusi kemampuan gerak dalam aktivitas fisik tercakup dalam warisan biologis, keterjangkauan gerak, pengaruh teman sebaya, dan motivasi internal siswa. **Kesimpulan:** Disimpulkan bahwa kemampuan gerak individu dapat dikaitkan dengan berbagai faktor. Dalam konteks program pendidikan jasmani, untuk meningkatkan kemampuan siswa dalam penampilan aktivitas jasmani, kegiatan tersebut harus bersifat mendorong, menantang, menyenangkan, dan bersosialisasi untuk menciptakan partisipasi siswa yang positif dan aktif.

**Kata kunci:** warisan biologis, motivasi internal, keterjangkauan gerakan, aktivitas fisik.

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## ■ INTRODUCTION

Movement capability is a vital aspect of physical activity that can be defined as the individuals' ability to perform different kinds of movements. The idea of movement capability is essential because it plays an important part in determining an individual's overall health, fitness, and performance. There are different fundamental aspects in movement capability such as locomotion, manipulation, and stability. Studies have shown that performing locomotion activities can lower the risk of acquiring heart disease, diabetes, and obesity in a regular basis (Hallal et al., 2012). Similarly, manipulation provides benefit in reducing the risk of disability among older adults when regularly performing manipulation exercises (Martin, Ramsay, Hughes, Peters, & Edwards, 2015). Moreover, stability lowers the risk of falls among older adults when performing or enhancing balance and stability through exercise (Granacher, Muehlbauer, & Gruber, 2012).

However, the questions on what are the factors that can influence the movement capability of an individual in performing a physical activity are less traveled. Recently, there are studies that shown possible relationship between movement capability and physical activity. It is believed that individuals with higher motivation and support from the school and parents are more likely to engage in regular physical activity (Garcia, Bojos, & Sy, 2021), blood types (Garcia & Canillas, 2023), and biological factor and psychological factor (Garcia, 2022). Thus, improving movement capability may effectively increase physical activity levels and promote overall health (Warburton, Nicol, & Bredin, 2006). Moreover, there are several ways in improving movement capability which include exercise, physical therapy, and training programs. A study found that a 12-week exercise program that included resistance training, balance, and flexibility exercises significantly improved movement capability in older adults (Ferreira et al., 2018).

Moreover, genetics is a crucial factor that affects an individual's movement capability. It was found that genetic factors account for up to 70% of the variance in physical fitness levels among individuals (Bray, Hagberg, Pérusse, Rankinen, Roth, Wolfarth, & Bouchard, 2009). Specific genes are associated with various aspects of movement capability, such as muscle strength, flexibility, and endurance. A study found that variations in the ACTN3 gene are associated with muscle strength and power (Baltazar et al., 2020). Similarly, age is another significant factor that affects movement capability. As individuals age, their movement capability tends to decline due to several factors, including decreased muscle mass, decreased bone density, and reduced joint flexibility. A study presented that older adults have reduced movement capability compared to younger adults, particularly in tasks that require speed and power (Hunter, Plaisance, Carter, & Fisher, 2018).

Then gender can also affect movement capability, with males generally exhibiting higher physical performance levels than females. Thus, males have higher muscle strength and power levels than females (Bartolomei, Grillone, Di Michele, & Cortesi, 2021). However, it is essential to note that several factors, including training status, body composition, and age, can influence gender differences in movement capability. Furthermore, physical fitness is a critical factor that affects movement capability. Regular exercise and physical activity can improve movement capability by increasing muscle strength, endurance, and flexibility. A study found that regular exercise enhances movement capability in older adults by increasing muscle strength and balance (Lyu et al., 2023). Similarly, injury history can also affect an individual's movement capability. Previous injuries, such as joint or muscle injuries, can lead to a reduced range of motion, muscle weakness, and decreased overall movement capability. A study found that

previous knee injuries can significantly impact movement capability, particularly in tasks that require jumping and running (Arundale, Silvers-Granelli, & Snyder-Mackler, 2018).

Several factors affect an individual's movement capability in performing physical activity, including genetics, age, gender, physical fitness, and injury history. However, there is a shortage of qualitative studies that explain firsthand or lived experiences of an individual that talked based on their influence on movement capability. Understanding the lived experiences of individuals on the influences of movement capability provides evidence for developing effective strategies to improve movement capability and achieve better overall health and physical performance.

## ■ METHODS

### Informants

Purposive sampling was used to identify the eight (8) informants. The inclusion and exclusion criteria were set such as informants must be active in sports-related, dance-related, and recreational-related physical activity, must be within 17–20 years of age, and must be a first-year students taking physical education subject in the identified university in Cebu, Philippines. Moreover, ethical considerations were satisfied before the conduct of the study such signing of the informed consent form and permission to conduct the study in the university.

### Design

This study used a qualitative approach employing multiple case study research in looking into the lived experiences, ideas, thoughts, and emotions of the eight case informants in the context of movement capability. Indeed, the qualitative approach is used to understand and explore issues or phenomena in a way that individuals must share their stories and hear their voices (Creswell, & Creswell, 2017). Semi-structured interviews were used to gather the data

needed for the study. The importance of translating or forming meaningful descriptions of the data must be coming from the transcribed data of the informants (Patton, 2002).

### Instrument

Semi-structured interview questions was served as the instrument of the study. The instrument was composed of eight questions concerning on movement capability of the individuals' physical activity. The questions described the informants' different experiences regarding their engagement in physical activity. Further, it asked explicitly who influenced and motivated them and what makes them move. The informants were given enough time to explain their answers to every question. Additionally, the researcher was also careful in looking into the informants' facial or gestures expressions because these things are essential in culling out the meaning of the spoken words. Moreover, the questions underwent series of content validity by three (3) experts of the field to ensure its validity and reliability of the questions in the study.

### Data Analysis

Before the emergence of the themes, the data went through seven stages of qualitative analysis (Braun & Clark, 2006). First is the transcription. The transcription comes from the 8 cases of the informantss during the interview. In the transcription every detail of the informants' opinions must be capsulated in the transcripts so that no ideas will be missed. Second is the reading and familiarization of the transcripts. In this step, it is required to read the transcripts several times to create familiarization with the cases or transcripts. Thus, familiarity is a necessity in cultivating codes within the transcripts. The third is coding. Coding is essential to get the words repeated in the transcripts, either in phrases or words, which gives a better understanding of the cases of the informants. In the study, several

codes like “family,” “friends,” “enjoy it,” “challenging,” and “happy doing it” were a few of the codes that can be found in the transcript. Thus, identifying the codes somehow illuminate the informants’ experiences in movement capability. Third is searching for themes or identifying patterns among the coded words or phrases. In identifying which patterns are the most relevant for answering a particular research question, the frequency of appearance of a specific code is essential.

Nevertheless, some codes would not frequently appear but are meaningful for answering the research question. Hence, looking at the frequency and meaningful codes are the considerations in searching the themes of the study. Fourth is reviewing themes. This stage allows the formulation of themes based on relevance and understanding. The Fifth and sixth steps are defining and naming the themes. These stages were capsule the entirety of the study on movement capability by having the definition and names of the themes. Though sub-themes could still be seen in this part, the sub-themes can also be considered independent. Lastly, the seventh stage is finalizing the analysis. This stage generates the emerging or final themes and explains the finality of a model or theory. Four themes emerged in the analyzed data.

## ■ RESULTS AND DISCUSSION

The purpose of the study is to know the attributions of movement capability in the individual’s physical activity. An in-depth interview was done to obtain the informants’ responses to their experiences of movement capability in physical activity engagement. Then, using Braun and Clarkes’ thematic analysis steps was used. There were (4) four themes emerged after the analysis such as biological inheritance, movement affordance, internal motivation, and peer influence.

### **Biological Inheritance**

The biological inheritance is the process by which an offspring cell or organism obtains or develops predisposed to characteristics of its parent cell or organism. Through inheritance, differences exhibited by individuals can collect and cause a species to evolve (Bateson, 2015). Further, family backgrounds can influence what one becomes and children is a complex biological organism (Atencio, Yi, Clara, & Miriam, 2014). Thus, children have the biological characteristics that influence them how to move. Compatibly, parental influences play an essential role in the engagement, involvement, and making a difference in children’s physical activity (Toogood, 2013), encouraging parents to increase physical activity is highly effective in elevating children’s physical activity involvement (Holm, Wyatt, Murphy, Hill, & Odgen, 2012), and positive contribution for parents in giving support to physical activity practices of their children (Davison, Cutting, & Birch, 2003). In the interview, the informants were able to positively signify that they got their interest and attributes toward physical activity from their parents, either from the mother’s or father’s sides and from their grandparents. Below are the utterances of the informants.

*K11 & K14 said that “I got my attributes and/ or interest from my parents”. K13 mentioned that “it runs from our blood to engage in physical activity”. On the other hand, K15 & K18 stated that “my grandparents had influenced them in involving in physical activity”. Additionally, K12 said that “his father had a great influenced in terms of engaging in basketball”.*

The result of the study proves that indeed parents influenced have contributed in the capability of their children to move as they are motivated to engage in physical activity that their

parents are engaging. Hence, in this study, we called it biological inheritance. It is comforting that even a tiny amount of support of their parents/families can significantly influence their children. Thus, biological inheritance in the context of parents' contribution impacted one's involvement in physical activity. In the same vein, it is recommended or encouraged to parents to positively participate in any physical activity since their children tends to mimic their actions and disposition in life. Hence, constant reminders must be given to their children especially in building their health through involvement in various physical activities.

### **Movement Affordance**

Affordance is considered a possibility of movement in which an individual or perceiver can decide on the action to counter the environmental cues or events. In the study, when informants were asked what limits them to perform in physical activity, they had varied responses but pointed to one idea on movement affordance. Similarly, it emphasizes what kind of movement, skill, or motor skill competence they are asked of. Thus, their decision to move depends on the physical activity they will perform now. Often in our lives, we asked ourselves if we can make it or not. Thus, every day we make decisions as a sign that we are still living and functioning. Similarly, we make decisions in the movement that we take such as in engaging in physical activity. However, we are bound on the decision on whether we can do it or not. This is what we called movement affordance which movement is based on affordance, that allows action-scaled in reaching a target, pick-up of critical reach distances, and distinct coordination modes for reaching may be available (Choi & Mark, 2004). Below are the utterances of the informants that signify their movement affordance.

*KI7 said that "If I am not in the mood or sometimes if the activity is difficult to perform, I am hesitant to perform it". KI5*

*said that "I love to perform physical tasks if I think I can do them, and I will be challenged to do it". KI2 and KI8 stated that "If I think I cannot do it or discourage to do it because it is difficult". KI3 and KI4 "If I am tired or if the activity seems difficult to perform, but sometimes it is really a choice if I perform or not". Additionally, KI1 and KI6 said that "If the physical activity is not challenging or easy to perform".*

This idea delimits the performer's ability and the decision on the performance of the physical activity. Similarly, movement affordance refers to the opportunities of movement that the environment provides in an individual. Thus, there is a strong relationship between the executor and environment which is directed on perceptual structures for goal-directed behavior (Buschman, & Miller, 2014). The concept of movement affordance has gained increasing attention in recent years as a critical factor affecting movement capability. Hence, the availability of recreational facilities, green spaces, and walkable neighborhoods, were positively associated with physical activity levels (Norman et al., 2013). Furthermore, movement affordances can influence the type and intensity of an individual's physical activity. For example, individuals living in areas with abundant opportunities for outdoor activities may be more likely to engage in higher-intensity activities such as running or hiking. In the same manner, individual characteristics, such as age and physical ability, can also affect the relationship between movement affordances and movement capability. It has been proven that older adults living in neighborhoods with higher levels of walkability had better movement capability, particularly in lower body strength and balance activities (Christian et al., 2015). This means that accessibility or opportunity as provided by environment can directly impact the involvement of the individual in engaging in physical activity. However, individuals with physical impairments may have different movement affordances and

require different environmental adaptations to support their movement capability. Moreover, the importance of movement affordances in movement capability has implications for urban planning and design. Creating environments that provide abundant opportunities for physical activity can promote movement capability and improve overall health outcomes such as sidewalks, bike lanes, and street connectivity, were positively associated with physical activity levels in urban environments (Sallis et al., 2016). Further, the availability of environmental opportunities for physical activity can influence the type, intensity, and frequency of physical activity engagement, ultimately affecting an individual's movement capability. Thus, teachers should foreground the importance of playful movement and underscore creativity, spontaneity, and risk-taking in their lessons in providing right environment for movement (Evans & Penney, 2008). In the same vein, physical education teachers must put effort into designing activities suitable to the students and require just enough difficulty for the students to get motivated to perform the given physical activities.

### **Internal Motivation**

Internal motivation in this context talks about what drives the informants to engage in physical activity. Feelings and emotions and positive outcomes are their motivations in the involvement of physical activity. The drive to move is sometimes if not often driven by the interest and desire to engage in any physical activity. This is called internal motivation. In recent years, internal motivation has gained increasing attention as a critical factor affecting movement capability. Internal motivation is a crucial predictor of physical activity engagement and maintenance. It was found out that individuals who reported higher levels of internal motivation had higher levels of physical activity engagement and were more likely to maintain their physical activity behaviors over

time (Ryan & Deci, 2000). Additionally, internal motivation has been linked to many positive outcomes, such as improved physical fitness, reduced risk of chronic disease, and better mental health. Thus, individuals incline to be motivated if happiness or enjoyment is involved and supported by their loved ones (Menges, Tussing, Wihler & Grant, 2017). Below are the utterances of the informants that signify on internal motivation as a factor for them to move.

*KI expressed that "First is for health. Second for recreation and lastly sometimes PE subject requires it. Yes, I find enjoyment in physical activity especially when I like the activities." While, K12 said that "I am happy while a play basketball with my friends and in school especially high school I play it during intramurals with my classmate. Yes, off course. Especially when I play it with my friends." Then, K13 emotionally said that "I am happy doing it especially if we will win in dance competition. Yes, because it makes me feel good and satisfied every time I am dancing." Further, K14 articulated that "I like it and sometimes my friends ask me to join especially group dance activity. Yes, I love doing some physical activity especially in school during intramurals or foundation day and with my friends and classmates." Additionally, K15 uttered that "aside from I feel good and happy doing it, for me it a form of outlet for me to express myself. And, I love it. Yes, for sure. It gives happiness and room to express myself." Lastly, K16 also expressed that "I enjoyed it so much. I can tell my lolo that I managed to inherit his love in swimming. Yes, because I feel happy in what I am doing." All the informant were happy in engaging in physical activity*

However, the importance of internal motivation in movement capability has implications for physical activity interventions and programs. It was found out that interventions

targeting internal motivation, such as goal setting and self-monitoring, were more effective in promoting physical activity engagement than interventions targeting external motivation, such as rewards or punishments (Ng et al., 2012). Furthermore, creating supportive environments that promote internal motivation, such as providing opportunities for social support and autonomy, can promote movement capability and improve overall health outcomes (Garcia, Bojos & Sy, (2021). All the informants were happy to engage in physical activity. This elaborates that supporting and meeting their needs and psychological needs in their active engagement in physical activity provides positive influence. Hence, positive experiences in physical activity engagement can promote wellness and public health. Thus, inculcating enjoyment, appearance, and feeling good in physical activity are significant in participating in physical activity (Poobalan et al., 2012). Giving social games or group games must always be considered as one of the physical activities to be given to the students. The drive to engage in physical activity based on personal interests and goals can lead to greater physical activity engagement, enjoyment, and, ultimately, improved movement capability. Moreover, the relationship between internal motivation and movement capability can be explained by the fact that intrinsically motivated individuals to engage in physical activity are more likely to have a positive attitude towards physical activity and experience greater enjoyment during physical activity engagement. It can lead to excellent movement capability, as individuals are more likely to engage in physical activity regularly and challenge themselves to improve their movement skills and abilities.

### **Peer Influence**

Peer influence is also a vital part of the development of an individual. Sometimes peers remodel the characteristics of an individual,

especially if spending most of the time with them. Thus, the statements showed that their friends or peers had contributed something to their move or perform physical activity as they spent time together. When adolescents spend more time with their peers, specific peer-related stimuli somehow influence them to become like them (Albert, Chein & Steinberg, 2013). Consequently, peer socialization has a higher possibility of association with character, or behavior change at different levels (Dishion, Bullock & Granic, 2002). Moreover, peers can significantly influence an individual's physical activity behavior and movement capability. Peer influence can be positive and negative, depending on the nature of the social interactions and the norms established within a peer group. Peers' Influence can impact movement capability in several ways. One of the primary mechanisms through which peers influence physical activity behavior is by creating social norms and expectations regarding physical activity engagement.

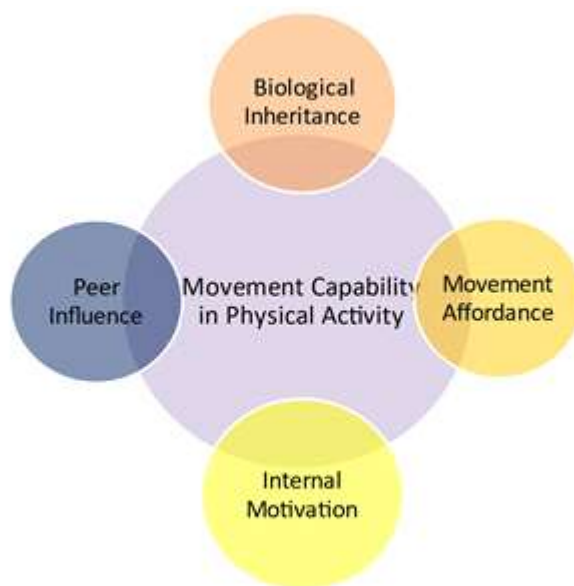
*KI8 said that "sometimes I also jog together with my friends or family". KI6 stated that "I like it, and sometimes my friends ask me to join, especially in group dance activities". KI2 stated that "she feels good, satisfied, and happy to dance with friends". Additionally, KI4 said that "I got it from friends or even from school activities". Then, KI2 said that "I can say that my friends and classmates and even activities in school have influenced me in doing physical activities".*

Moreover, peer support for physical activity was positively associated with physical activity levels among adolescents, while peer pressure to engage in sedentary behaviors was negatively associated with physical activity levels (Gopinath, Hardy, Baur, Burlutsky & Mitchell, 2012). Additionally, peers can serve as role models for physical activity engagement and provide social support and encouragement for individuals to

engage in physical activity and improve their movement skills and abilities. However, peers can also have a negative influence on movement capability. Peer victimization was negatively associated with physical activity engagement and movement capability among children and adolescents. It highlights the importance of creating supportive social environments that promote positive peer interactions and reduce negative peer influences (Lubans et al., 2016). The influence of peers on movement capability has important implications for physical activity interventions and programs. Interventions that promote positive peer interactions, such as team-based or peer-led physical activity programs, may be particularly effective in promoting physical activity engagement and improving movement

capability. Additionally, interventions that target social norms and expectations regarding physical activity engagement promote positive peer influences and improve movement capability. Thus, positive peer influences can promote physical activity engagement, while negative influences can hinder movement capability. This implies that choosing friends or peers is as important as developing a part of oneself. Hence, choose wisely in spending time with others. Understanding the relationship between peers' influence and movement capability can inform strategies to promote physical activity and improve overall health outcomes.

Below is the schema of the model on the attributes of movement capability in physical activity.



**Figure 1.** Model on the attributes of movement capability in pa

This qualitative study on the attributes of movement capability in PA provides another lens on understanding movement in the context of qualitative analysis of data which strengthened the claims that movement capability can be influenced by biological inheritance, movement affordance, internal motivation, and peer influence. This can

be also a venue for further research in validating such claims to ensure the validity and reliability of the formed model on movement capability. Further, the model can help not only the students but also the teachers in crafting physical activity in their lessons that can activate and promote mobility towards good health and well-being.



## ■ CONCLUSIONS

Movement is a complex context in physical activity. Thus, this study concluded that individuals' biological inheritance, movement affordance, internal motivation, and peer influence are the attributes that enveloped movement capability in physical activity. Hence, in the context of physical education programs, it must be grasped that enhancing the students' movement capability in the physical activity must be encouraging, challenging, enjoyable, and sociable to create positive and active student participation.

Understanding the attributes of movement capability in PA contributes to the body of knowledge in developing the wellness of people or individual which in a way can be translated to a healthy community and country. However, validation of these attributes on movement capability in PA must be conducted as future research endeavors in strengthening the claim or rejecting the claim.

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