**Investigation of Mn and Fe/Co-Doped ZnO Nanocrystalline: Examining Synthesis, Structure, and Ferromagnetism at Room Temperature**

Sanjay Kumar1

*GL Bajaj Institute of Technology &Management, Greater Noida, India*

*MitraMandal’s College Of Engineering, Pune, India*

Parth Patil[[1]](#footnote-0)

*Marathwada MitraMandal’s College Of Engineering, Pune, India*

***Abstract:*** The demand for safety and sustainable transportation brings innovation in vehicle technology. Bicycling is one of the oldest and fittest ways of transportation. A lot of research is going on self-balanced and autonomous two-wheeler vehicles to attract riders. An attempt is made here to propose the design components of autonomous self-balancing bicycles. Gyroscopes, widely used in stabilizing systems, emerge as a vital component in the development of self-balancing bicycles. This study focuses on use of gyroscopes and specifically designed flywheel, aimed at facilitating autonomous motion along both straight trajectories and curved paths. This paper illustrates how gyroscopes and flywheel maintain stability in self-balancing bicycles during tilting. Autonomous capability includes use of various sensors and camera to detect objects for navigation and use computer vision efficiently with the help of machine learning algorithms. The proposed design framework will help in a transformative era of innovation in urban mobility, promising safer and more sustainable ways of getting around in cities.

***Keywords:*** autonomous vehicle, self balancing, smart driving, smart vehicle

All text: Times New Roman, 12 Punto, (Special: First Line, by: 1.27 cm), (single space), (justified), (Layout- Margins- Normal Top: 2,5 cm Bottom: 2 cm Left: 2,5 cm Right: 2,5 cm), (Spacing: Before: 0 cm, After: 0 cm)

The fundamental objective of multicultural education is to help students consider their diversity of ethnicity and race as an educational alternative and develop their knowledge, skills and behaviors necessary for them to perform various educational activities, and to restructure schools in this direction (Ajzen, 1985). Multicultural education supports students to show tolerance towards those with backgrounds different from theirs on the one hand, and focusing on the protection of each student’s cultural heritage on the other (Barnea, 1998).

**Figure 1**

*Interaction Between Main Actors of the Integration Process*



1. **Literature Review**

The existing studies in school choice document that parents take into account numerous factors when determining their children’s school enrollment. What may be surprising is that academic quality is often not the only or even main variable in such decisions. For example, parents often move to communities and enroll their children in schools through the assistance of their social networks. Parents turn to family members, friends, and coworkers to obtain recommendations on communities and schools (Lareau, 2014). Because social networks in the U.S. are heavily segregated by race and social class, parents often end up in communities and schools that mirror their social backgrounds (Lareau, 2014; Sattin-Bajaj & Roda, 2018). Meanwhile, most white parents view majority black and Hispanic schools as undesirable (Billingham & Hunt, 2016), and segregation by race in America’s public schools has increased markedly since the 1980s (Johnson & Nazaryan, 2019; Logan et al., 2012). Relatedly, the convenience of the school’s location, behavioral and discipline standards, and the perceived safety of the school are all primary factors in school decisions (Lareau, 2014; Schneider et al., 2000).

To be sure, parents’ value academic quality, but many, particularly those who are white, conflate academic quality with predominantly white schools. Relatedly, white parents often overlook or simply refuse to send their children to high-performing schools that have majority black or Hispanic student bodies (Billingham, 2017; Billingham & Hunt, 2016). Moreover, parents utilize their highly homogeneous social networks in their inquiries into teachers, the student body, and the overall school environment rather than using more objective, academic metrics and data that states and school districts collect (Holme, 2002). Ultimately, school choice patterns both effect and are affected by longstanding institutional patterns and inequities.

In regard to private schools, studies indicate parents often opt for them when local public schools are deemed unsatisfactory in some way. Billingham and Kimelberg (2013) and Goldring and Rowley (2006) found that parents select private schools in order to have more control over their children’s education, including greater access to teachers and school staff. For example, Billingham and Kimelberg (2013) found that Boston parents who enrolled their children in the city’s public elementary schools, often left for private schools or the suburbs once their children reached middle school or high school. They felt the city’s public middle and high schools were too big, making parental control out of reach. Yet, other studies indicated that “pull” factors pertaining to private schools generally outweigh what “pushes” families away from public schools. These factors include the religious values espoused in private, parochial schools, the lure of smaller class sizes, the belief that children should wear uniforms, and how these schools differ in their approaches to disciplinary and behavioral standards (Lankford & Wyckoff, 1992).

A growing body of literature, however, has begun to examine the experiences of urban middle-class parents who forgo private school options and remain in central-city public schools (Cucchiara, 2013a, 2013b; Posey-Maddox, 2016; Posey-Maddox et al., 2014; Posey-Maddox et al., 2016). These studies have mostly focused on white middle class parents of children who are at the elementary school level. These parents enroll their children in city public schools for various but inter-related reasons. First, enjoying the unique lifestyle city living provides, they have decided to settle in central cities rather than suburban areas (Billingham & Kimelberg, 2013; Cucchiara & Horvat, 2014). Some are also drawn to the diversity in urban public schools, settings that reflect the “real world” (Cucchiara, 2013b). Additional parents are open to “trying out” the public schools in their urban neighborhoods (Stillman, 2012), whereas others have left-leaning political values and support urban public education as a social justice concern (Cucchiara, 2013b; Cucchiara & Horvat, 2014; Posey, 2012; Reay et al., 2011; Roda, 2018; Stillman, 2012). Other parents are turned off by the perceived, obsessive parenting styles they contend are more prevalent in wealthier, suburban schools (Cucchiara, 2013b; Stillman, 2012).

1. **Case and Methodology**

This research was conducted in Albany, New York, a city of roughly 100,000 residents in a metropolitan region approaching one million. About 10,500 students attend the City School District of Albany. Like other cities in the Northeast, Albany has suffered from both population decline and white flight since the 1950s, although these trends have reversed and slowed, respectively, during the last decade. The public-school population does not reflect the overall city population, with African American students constituting by far the largest group in the public schools, whereas the city is still majority white. The public schools in Albany, however, have never reflected the city’s broader population. This was mainly due to the sizable Roman Catholic parochial school presence in Albany, which always attracted large segments of children from Irish, Italian, and Polish American families (Rabrenovic, 1996).

Substantial problems face Albany Public Schools. In 2015, the New York State Department of Education (NYSED) placed three schools into receivership, including Albany High School. Under receivership, the state appoints a “receiver,” with the power to make substantial changes to a school, including firing the school principal and other administrators, extending the school day, and instituting new curricula and programs. Despite the overall district’s subpar performance, specific neighborhood elementary schools and elementary magnet schools perform relatively well (NYSED, 2018). The district also operates a highly touted high school International Baccalaureate (IB) program.

**Table 1(APA 7)**

*Social Characteristics of the Sample*

| Characteristic | No. of respondents (%) |
| --- | --- |
| Race/Ethnicity |  |
| White | 25 (56.8) |
| Black/African American | 19 (43.2) |
| Median Household Income (42 households) | $120,000 |
| $50,000 to $74,999 | 9 (21.4) |
| $75,000 to $124,999 | 16 (38.1) |
| $125,000 to $174,999 | 10 (23.8) |
| $175,000 to $240,000 | 7 (16.6) |
| Education (highest degree earned) |  |
| Graduate degree | 27 (61.4) |
| Bachelor’s degree | 9 (20.5) |
| Associate’s degree | 8 (18.1) |
| Number of Families & Level of Children |  |
| Elementary School Only | 17 (40.5) |
| Middle School Only | 1 (2.3) |
| High School Only | 7 (16.7) |
| Elementary and Middle School | 9 (21.4) |
| Elementary and High School | 0 |
| Middle and High School | 4 (9.5) |
| Children at all levels | 4 (9.5) |

I focus on middle class families because previous research suggests that, possessing greater resources, they are far more likely than their lower-income counterparts to achieve their school preferences (Lareau, 2014). The qualitative approach of in-depth interviews is also appropriate given this study’s aim at attempting to understand the complex ways in which parents choose schools and how this relates to meaning-making (Charmaz, 2014). The interviews were conducted in coffee shops, the participants’ homes, and in my campus office. Interviews were semi-structured with open-ended and subsequent follow-up and probing questions. Examples of questions were, “what led you to enroll your children in Albany’s public schools?” “What have your children’s experiences been like in Albany’s public schools?” “Did you or your spouse ever consider private schools?” “What led you to remain in the city of Albany?” “Have you or your spouse ever considered moving to the suburbs?” Therefore, this study used both deductive and inductive approaches. The former included pre-planned questions, whereas the latter arose from the interpretation of the participants’ unique responses and narratives.

The interviews ranged from 45 to 120 minutes, were audio recorded, and subsequently transcribed verbatim. All of the participants’ names and the schools their children attended were altered for confidentiality. The only exception to this was Albany High school, which is the city’s sole public high school. After completing five transcriptions, I uploaded the transcripts in Atlas ti qualitative software and began initial coding of the transcripts for key words, repetitive answer patterns, and common descriptors. After coding five transcripts, I subsequently uploaded, coded, and analyzed the remaining transcripts before returning to reanalyze the initial five transcripts for any codes that had emerged in the latter interviews. Atlas ti was also used in this inductive analysis to identify exceptions, sort, and group codes. After initial coding, focused coding was performed to assist in the aggregation of broader themes (Charmaz, 2014). Themes centered on skepticism regarding the superior quality of private schools, feelings of elitism in private schools, lack of services in private schools, heightened peer pressure and competition in suburban public schools, and elitism in suburban schools. Out of these thematic summaries arose the conceptual framework for the paper.

***Refugee Experiences and Social Interactions***

At every stage of adaptation to a new environment, the individual constantly evaluates the surrounding environment and makes adjustments based on the feedback from these interactions. Individuals also define their roles in society by observing other people’s reactions to them. In his classical theory of the *looking-glass self*, Charles H. Cooley (1902, in Yeung & Martin, 2003) claimed that “self is a result of the social process whereby we see ourselves as others see us.” Therefore, social interaction defines who we are and our definition of our identities. Limited interactions with the outside world, especially after traumatic events or sudden changes in social life could have severe effects on how individuals see and interpret the world around them (Gürer & Akgül, 2019). After leaving their country of origin, refugees lose their previous social connection which also affects their perception of identity. Their new social environment and interactions define their new self-perceptions. In other words, refugees' self-concept is shaped by their social interactions which eventually influence the re-shaping of refugees' new identities in the host societies.

Limited social contact and interaction with the members of the host community also reduces the likelihood of integration and lead refugees to develop relationships with communities that they share the same language and culture. When individuals during their integration process need assistance, having no contact from host communities gives no option but to seek help from communities that shares the same language and culture. One can argue that those communities are also part of the host society and such an approach might produce positive results for integration. However, those communities, in most cases, have their own integration problems and trust within these communities is not very well established. In addition to these structural problems, especially for political asylum seekers, contact with communities from the country of origin brings some risks therefore, they either stay isolated or become a part of a selective group in these communities. Not developing social interactions with mainstream society puts refugees in the already established diaspora or closed communities which hinder integration process in the long run.

In our interviews most of the participants indicated that they had difficulty to contact local communities to solve their immediate problems such as learning about the education system, communicating with bureaucracy, finding housing, etc. Therefore, most of the people asked for help from other people from a similar national and cultural background. In a recent study, Röing (2019) found that Turkish asylum seekers in the state of North Rhein Westphalia in Germany mostly contacted Turkish organizations that they found similar to their political views and social background. The same study further indicates that even in the Turkish communities there is a big difference in understanding each other and different political affiliations determine who refugees would contact. Turkish refugees have difficulty to develop out-group relationships and create new contacts due to their reluctance to become the target of their own government. In this case, differences originating from their home country and political affiliations increase the risk of isolation of refugees in host communities. One participant of this study who previously worked as a civil servant stated that;

*Like there was a clinical area I came to, a female medical ward, a patient in oxygen was dying, I was now asking the students which theory of nursing or which definition of nursing are you required to adopt in the management of the dying woman? They replied that Virginia Henderson’s definition of nursing will fit in that condition …“even unto a peaceful death.” Look at this woman I replied, find out whether she really is having that peaceful end. And they started running around, taking care of the needs of the woman in its entirety….,, so that even if the woman is dying, she will have a peaceful end”.* This participant continued to express how questioning facilitates the assessment of students’ understanding and practice of procedures. “*I ask them to demonstrate, we can give them a scenario either practical scenario, from there you can evaluate and see the student’s judgment to know if there is a vacuum, a gap, that has been created and how does this student try to fill in this gap, then you evaluate. Asking the right questions is an important skill for an instructor and the best way to assist students think through their practice.* **(Italic, indent Left: 2 cm, Right:2 cm)**

My field notes during the data collection combined with my own experiences in the process also reflect that during early phases of the integration process, establishing social connections is very important but difficult to do at the same time;

*At every stage of the integration process, the lack of social interaction is the main problem. Starting from the early stages of asylum application the later stages in the process of official integration establishing connections with the local people is the most difficult one. The full picture of difficulties establishing such relationships could be examined from both sides; why people have little engagement with foreigners and why refugees have the reluctance to get in touch with local populations. Language is definitely the number one issue for early stages and knowing another common language such as English gives an advantage at every level but not on every occasion. For example, when I wanted to develop professional connections, English language skills helped me to get in touch with people and meet them to discuss my situation or to express my needs. In any engagement in society, you realize that German language skill is the defining issue for further connections. This is true, for example, regarding our relationship with our neighbors. Not being able to speak perfect German we cannot develop strong relations.* (Field Notes, April 2018)

**Funding Details**

Please supply all details required by your funding and grant-awarding bodies as follows:

For single agency grants

This work was supported by the [Funding Agency] under Grant [number xxxx].

For multiple agency grants

This work was supported by the [Funding Agency #1] under Grant [number xxxx]; [Funding Agency #2] under Grant [number xxxx]; and [Funding Agency #3] under Grant [number xxxx].

**Disclosure Statement**

This is to acknowledge any financial interest or benefit that has arisen from the direct applications of your research.

**Style**

All submissions should follow APA style (Publication Manual of the American Psychological Association, 7th edition, 2020).

**References (Hanging By:1,27 cm, APA 7 Citation Format, Justified, APA style, References should be in the order of citations in text [1],[2] etc, details: http://owll.massey.ac.nz/referencing/apa-style.php)**

1. Benson, A., & Kipp, R. M. (2012). *Potamopyrgus antipodarum*. R http://nas.er.usgs.gov/queries/FactSheet.asp?SpeciesID=1008 ***(Web page)***
2. Castles, F. G., Curtin, J. C., & Vowles, J. (2006). Public policy in Australia and New Zealand: The new global context. *Australian Journal of Political Science, 41*(2), 131–143. https://doi.org/10.1080/10361140600672394 ***(Journal Article)***
3. Durie, M. (2003). *Ngā kāhui pou: Launching Māori futures*. Huia Publishers. ***(Book)***
4. Fainstein, S. S., & Campbell, S. (Eds.). (1996). *Readings in urban theory.* Blackwell. ***(Edited book)***
5. Heath, I. (2008). Domestic violence: A family health perspective. In J. Keeling & T. Mason (Eds.), *Domestic violence: A multi-professional approach for healthcare practitioners* (pp. 167–175). Open University Press. ***(Chapter in an edited book)***
6. Hsing, Y., Baraya, A., & Budden, M. (2005). Macroeconomic policies and economic growth: The case of Costa Rica. *Journal of Applied Business Research, 21*(2), 105–112. http://journals.cluteonline.com/index.php/JABR/ ***(Online Journal Article)***
7. Leiopelmatidae. (2012). In *Wikipedia, The Free Encyclopedia*. Retrieved July 26, 2012, from http://en.wikipedia.org/wiki/Leiopelmatidae ***(Encyclopedia entry online)***
8. Maclean, H. (1932). *Nursing in New Zealand: History and reminiscences*. http://www.nzetc.org/tm/scholarly/tei-MacNurs.html ***(Online book)***
9. Markusen, A. R. (1996). The economics of postwar regional disparity. In S. S. Fainstein & S. Campbell (Eds.), *Readings in urban theory* (pp. 102–131). Blackwell. ***(Chapter in an edited book)***
10. McShane, S., & Travaglione, T. (2007). *Organizational behavior on the Pacific Rim* (2nd ed.). McGraw-Hill. ***(Book later edition)***
11. Roach, M. (2010). *Packing for Mars: The curious science of life in the void* [Kindle]. W. W. Norton & Company. https://www.amazon.com/Packing-Mars-Curious-Science-Life-ebook/dp/B003YJEXUM/ref=tmm\_kin\_swatch\_0?\_encoding=UTF8&qid=&sr= ***(E-book reader book)***
12. Rountree, K., & Laing, T. (1996). *Writing by degrees: A practical guide to writing theses and research papers*. Addison Wesley Longman. ***(Book)***

**Notes on Contributors**

Please supply a short biographical note for each author. This could be adapted from your departmental website or academic networking profile and should be relatively brief (e.g. no more than 100 words).

**ORCID**

***Author 1,*** <http://orcid.org/0000-0000-0000-0000>

***Author 2,*** <http://orcid.org/0000-0000-0000-0001>

1. [↑](#footnote-ref-0)