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Indoor Optical Wireless Transmission under Artificial Neural Networks

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ABSTRACT

Optical Wireless Communication now becomes important part in technology era. It is mostly used in newly developed mobile technologies. This work describes the concept of PPM based modulation under SWT and ANN. The use of SWT-ANN provides improvement in BER and efficiency of system. Focus on the modulation aspects of the optical wireless communication, this work is used for enhance noise immunity of channel by utilizing optimized modulation to the channel by use of ANN in receiver side. This ANN helps to reduce BER value of system and enhance the system performance. In this, modulation technique OOK & PPM is used. It uses ANN method to reduce BER value in receiver side. It compares the performance of OOK based format with PPM in terms of BER and efficiency value. All results are calculated using MATLAB tool and PPM is better in terms of BER and efficiency value.

Keywords-OWC, OOK, PPM, BER Value, ANN etc.

I. INTRODUCTION

Optical remote correspondence shaft might be characterized as the telecom of light in environment which is regulated. It is utilized to give broadband correspondence. The beginning of this correspondence is in antiquated occasions when they utilized the fire guides for move message information over separations. In contrast with RF, optical remote correspondence delighted in advantages, for example, lower usage cost, higher security, unregulated range and operational wellbeing. Then again, the channel can be seriously meddled with by foundation clamor: shot commotion initiated by the foundation surrounding light (radiation from the sun if the framework worked close to a window) and the impedance incited by fake light sources.



Figure 1: Optical Wireless System [1]

Intensifier and channel modules were likewise utilized in the two units to improve the framework throughput and insusceptibility to commotion. The RF interface required range permit expenses that are to be paid to government bodies. These outflows are confined inside specific breaking points. The allotment for recurrence is found by nearby specialists. It might fluctuate from nation to nation that makes the interface exceptionally troublesome. In this, the RF channel gives portable availability in

view of communicate nature of framework yet it gives a few issues when gadget gets meddled for correspondence. concealment of electromagnetic vitality is troublesome at RF frequencies. The framework execution can discourage on the off chance that it is inappropriately done.

The ISI brought about by multipath spread and counterfeit light impedance from fluorescent light determined by electronic impact are two significant obstructions, and these should be considered when approving adjustment plans. The fundamental impedances for Infrared correspondence channel including foundation clamor and multipath entomb image obstructions (ISI). The multipath ISI was predominantly account when structuring correspondence frameworks.

The primary impedances for Infrared correspondence channel including foundation clamor and multipath obstructions. The multipath ISI was for the most part constrained by transmitter and recipient geometry. The beneficiary can transmit information or speak with the transmitter with the assistance of a multipath connect. For this situation, the multi-way connections can cover territories that can't be come to through a LOS joins. The foundation commotion brought about by the encompassing light from daylight and counterfeit light can be serious. The foundation light commotion can influence optical remote framework that utilizing the Infrared range. From survey, author analyzed wireless optical seawater channel transmission model and based on the transmission model, the OOK optical modulation and LDPC codes was combined to analyze the performance of the UWOC system and the transmission distance of wireless optical (TDWO) in different seawater environments. The results showed that the clearer the water quality, the better performance of LDCP coding system. and when the optical source was 30mW, the TDWO was less than 6.2m, the coding system can improve the system performance in offshore environment. Some proposed an optical wireless turbo coded system using a new signaling scheme called hybrid PPM-OOK signaling (HPOS) was proposed. The information bit stream of the turbo coded system was represented by PPM signaling and the parity bit streams were indicated by OOK signaling. The decision for OOK was optimized via the PPM signal. The proposed system was evaluated through computer simulation in optical wireless channel. In this, it explored ANN-based recipient for baseband balance systems including OOK. Area II exhibits the intensity channels in this system. In Section III, It characterizes proposed procedure of framework. In Section IV, It characterizes important results of proposed System. At last, conclusion is clarified in Section V.

II. INTENSITY CHANNELS OF OPTICAL WIRELESS SYSTEM

In this segment, it characterizes the physical start for the different adequacy and force controls just as transmission qualities in indoor situations

1. Basic Channel Structure

The optical quality of a source is well characterized as the optical force delivered per strong point in units of Watts per steradian [3]. Remote optical connections pass on information by balancing the prompt optical force quality, in answer to an information electrical flow signal x(t). The message data sent on this divert isn't contained in the adequacy, stage or recurrence of the transmitted optical waveform, but instead in the force of the transmitted sign. optoelectronics Present can't day work straightforwardly on the recurrence or period of the 1014 Hz go optical sign. This electro-optical transformation process is called as optical force regulation and is every now and again capable by a light transmitting diode or laser diode that is working in the 850-950 nm wavelength band. Table 1 incorporates a rundown of the essential classes under which an optical radiator can fall. Class 1 activity is generally alluring for a remote optical framework since outflows from items are protected under all conditions. Under these conditions, no admonition names should be applied and the gadget can be utilized without extraordinary

security safety measures. The wellbeing of these frameworks is kept up by finding optical bars on housetops or on towers to forestall incidental interference.

Safety Class	Interpretation
Class 1	Safe under reasonably foreseeable conditions of operation
Class 2	Eye protection afforded by aversion responses including blink reflex
Class 3A	Safe with viewing with unaided eye
Class 3B	Direct Intra beam viewing is always hazardous

Table 1: Interpretation of IEC Safety Classification for Optical Sources

2. Channel Interferences

a. Multipath ISI

The principle impedances for Infrared correspondence channel including foundation clamor and multipath bury image obstruction (ISI). First case demonstrated multipath proliferation can make twisting the beneficiary when LOS way was accessible. Second case demonstrated when LOS way was not accessible (for example hindered), the multipath proliferation can be utilized to keep up correspondence through reflections.

b. Background Light Interference

The principle impedances for Infrared correspondence channel including foundation commotion and multipath bury image obstructions (ISI). The collector can transmit information or speak with the transmitter with the assistance of a multipath interface. For this situation, the multi-way connections can cover zones that can't be come to through a LOS joins. The foundation commotion brought about by the encompassing light from daylight and fake light can be extreme. The foundation light commotion can influence optical remote framework that utilizing the Infrared range. It indicated the foundation radiation power ghastly thickness of daylight, glowing and rich lighting. This indicated the Infrared optical channel can endure exceptional mutilation brought about by the foundation encompassing commotion. The daylight and radiant light displayed less occasional qualities than the bright light. In this manner an optical channel can be utilized to viably square quite a bit of these two sorts of radiation.

III. PROPOSED SYSTEM MODEL

In Undecimated Wavelet Transform (UDWT), the signal is represented with same number of wavelet coefficients by neglecting the decimation process after convolution. The SWT has following merits over DWT:

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• Even though the SWT requires more calculation and calls for bigger memory, it enables better denoising quality and better edge detecting capacity.



Fig 2: Proposed System Model

• Since the number of coefficients is halved in subsequent resolution levels of DWT, due to down sampling (decimation) process, it is usually suitable for implementing for discrete signals or images whose size is power of two. But SWT can be implemented for any arbitrary sizes of images since the down sampling process is not applied so as to keep the number of coefficients is same in all the resolution levels. For this reason, the SWT can also be called as Undecimated Wavelet Transform.

Figure 2 shows proposed system model. This work presents a system with OOK & PPM modulation scheme. It also uses SWT based receiver with ANN for error minimization. The modulation formats are described as below:

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1. OOK Modulation Scheme

The channel utilized for transmitter has a solidarity plentifulness beat with reaction p(t). It works at a piece pace of R_b that gives beat of span 1/R_b. For keeping up normal transmitted force in optical field Pav=P, the transmitter produce visual quality force 2P to symbolize somewhat "1", and no capacity to symbolize somewhat "0". Accepting the beat shape P(t) is standardized to solidarity, the transmitted OOK beat sign can be spoken to as:

$$P(t) = \begin{cases} 1 & for \quad t \in [0, t) \\ 0 & elsewhere \\ (1) \end{cases}$$

The data transfer capacity of OOK plot is given by $R_b=1/T$. In for example characterized as the opposite of heartbeat width. characterized as way, OOK plot is the benchmark for different arrangements utilized for optical remote area. That is the reasonable discovery which utilizes direct Also it is easy to detect and generate. The probability of error is given as,

$$P_{e} = \frac{1}{2} \operatorname{erfc} \left[\sqrt{\frac{E}{No}} \right]^{*}$$

(2)

The bit error rate or the probability of error is used to judge the performance of system. It must be as small as possible.

2. Pulse-Position Modulation (PPM)

In that plan the abundance and the width of the beats is kept steady, while the situation of each heartbeat, regarding the situation of a reference beat, is changed by the quick examined estimation of the adjusting signal. In this way, the transmitter needs to send synchronizing heartbeats to keep the transmitter and recipient in synchronism. As the width and sufficiency of the beats are steady, the transmitter handles consistent force yield, an unmistakable bit of leeway over the PWM.

3. BER under ISI

The BER articulation for various balance plots under both ISI and foundation encompassing light clamor can be determined. During an example of time interim Tc, vitality y of kth test landing at the edge identifier is

$$y = z + Nawgn, \ z = s + m$$
(3)

Where z is vitality gotten by light finder and Nawgn is motivation vitality of the added substance white Gaussian commotion. The commotion happens in this channel is a direct result of quality of foundation helping conditions.

4. Proposed Algorithm

Step 1: Generate Input data stream Step 2: Select the modulation format OOK /PPM Step 3: Generate the Modulation Step 4: Calculate y(t) = x(t) h(t)Step5: Addition of Noise Y(t) = y(t) + n(t)Step6: Threshold Detection and apply SWT Step7: Calculate BER by ANN If BER <=Goal then; Save Results Else Repeat steps from step 2 END

In that work it presented the investigation of the ANN based receiver for the baseband modulation techniques including OOK and PPM. The ANN network uses the feed forward and feed backward filters for best knowledge of the bit error rate. The training, testing and validation is also done by ANN. The multipath instigated ISI and BER were the two most significant impedances that influence the presentation of indoor optical remote correspondence frameworks.

IV. RESULTS & DISCUSSION

In this work, a wavelet-ANN based recipient is proposed. In ANN, a backspread idea was utilized for limiting the mistake in framework. The SWT utilized in the framework goes about as a prepreparing highlight for neural system. The principle issues in the framework are ISI and light impedance. These issues are taken care of by proposed framework having wavelet based recipient. In neural system, it takes 100 neurons in first layer and gave 1 in yield layer. These neurons are prepared with number of tests before arrangement happens. In this, signal is characterized as discrete examples with interim 1ns.

Table 2. Input Farameters of System						
Parameter	Value					
No. of Symbols	100					
Samples per Symbol	40					
Word Blocks	2					
Data rate	200 mbps					

Table 2:	Input	Parameters	of System
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Because of this, it increment the estimation of cost while including high recurrence source. Better BER execution can be acquired by planning the framework adjustment/demodulation to accomplish a higher normal BER first, and afterward decreasing the outcomes to the objective BER esteem through ANN beneficiary. To compute the surrounding light obstruction, the channel motivation reaction inside a period interim was considered.



Figure 3: BER Response of OOK using DFE

Figure 3 shows the BER response of OOK with SWT-ANN system and complexity is less. Hence efficiency is quite low. The SWT produces coefficients for every scale up to a scale where it chooses to terminate the analysis. The time taken to run simulations using SWT under MATLAB has been restrictive. In this work, The discrete wavelets includes consecutive and corresponding filters like low pass and high pass for splitting the signal into detail coefficients with its estimation. With traditional filtering, this would leave us with two signals both with the same number of sample points as original. However, SWT process down-samples both signals by a factor of 2. The decomposition process is iterated as many times as required. Although techniques such as the use of equalization filters can be effective to reduce the ISI, yet were not optimized for dynamic ISI interference, and usually came at cost of system complexity. In order to maintain the channel throughput under combined impairments, adaptive modulation scheme is proposed.



Figure 4: BER Response of PPM Modulation with SWT

Figure 4 presents results using PPM modulation technique with SWT and ANN at receiver side. Since, PPM shows better response in BER and efficiency as compared to OOK technique in every aspects. PPM depends upon pulse position factors. The communication reliability of PPM is better than that of OOK.



Figure 5: Irradiance vs. Data Rate for PPM Modulation using SWT



Figure 6: Irradiance vs. Voltage for PPM Modulation using SWT

Fig 5 & 6 shows the irradiance response of PPM modulation using SWT and ANN. This result shows that as data rate increases, irradiance shows exponentially increasing behaviour at around 2700 Mbps and then starts decreasing at high data rate. Similarly, as the voltage increases, irradiance shows peak at 26 V and then starts decreasing exponentially. Table 3 shows the performance comparison of OOK and PPM

Modulation technique using ANN method and results show that PPM output is better as compared to OOK modulation using ANN in terms of BER & efficiency. Hence, it is more effective in terms of BER. and results also show that PPM is bandwidth efficient as compared to OOK.

Parameter	ООК	PPM
BER	0.07	0.008
Efficiency	63.2 %	74%
Peak Irradiance (mW/m ²)	02	04

Table 3: Performance Comparison for OOK & PPM Modulation

V. CONCLUSIONS

This work provides the concept of PPM based modulation using SWT and ANN method. The use of ANN is to reduce BER value under less computational time. In this work, System performances under combined multipath ISI and background ambient light noise are validated using OOK & PPM modulation scheme. This work uses wavelet as a receiver for handling the data bits. The work uses the MATLAB tool for providing effects of Inter-symbol Interference and light interference on this receiver. This included fully understanding the mathematical model of the channel, noise sources and error performance under each or combined interferences. It uses ANN method to reduce BER value in receiver side. Results presented here can be used to further demonstrate the capability of adaptive OOK & PPM modulation. The simulation results help confirming the feasibility of the adaptive modulation techniques which is used for the optical wireless channel. The performance of this system is analyzed based on BER value. The result shows the performance comparison of OOK using DFE and PPM Modulation technique using ANN method and results show that PPM output is better as compared to OOK modulation using ANN in terms of BER and efficiency.

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Spectrophotometric Determination of Antiulcer drugs using 2,2'-bipyridine as Complexing agent

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ABSTRACT

Simple, sensitive and rapid spectrophotometric method for the determination of certain proton pump inhibitors belonging to the benzimidazole class of compounds has been developed. The method is based on the reaction of these antiulcer drugs namely omeprazole (OMZ), lansoprazole (LNZ), pantoprazole (PNZ), rabeprazole (RBZ) and esomeprazole (EMZ) with iron (III) and subsequent complexation with 2,2' -bipyridine which forms a pink coloured product with maximum absorption at 530 nm. The commonly encountered excipients and additives along with the drug did not interfere with the determination. Antiulcer drugs in the range of 200 - 4000 ng mL-1 for LNZ, PNZ and RBZ, 80 - 2800 ng mL-1 for OMZ and 200 - 3800 ng mL-1 for EMZ can be determined by this method. Results of the analysis of commercial capsules/tablets (omelac capsule, lanpro capsule, pan tablet, rabeloc tablet and raciper tablet for OMZ, LNZ, PNZ, RBZ and EMZ, respectively) by this procedure agree well with those of the reported method.

Key words: 2,2' -bipyridine, antiulcer drugs, spectrophotometry, determination, OMZ,LNZ,PNZ,RBZ,EMZ

Introduction:

Ulcer is considered as a very common and conventional disease all over the world and the statistical data indicates that more than 10% of the adult population are affected within their life time. In developing countries like India because of the high cost of the prescribed antiulcer drugs (proton pump inhibitors) new antiulcer substances are very much essential. Peptic and duodenal ulcer is a peptic ulcer disease which arises due to the defect in the mucosal surface of the stomach or duodenum. Peptic ulcer occurs more often in individuals from 20 to 60 years of age with males. The symptoms of peptic ulcer include abdominal pain, nausea, epigastric gnawing, heartburn, acid eructations, haemorrhage, anaemia, weight loss, and vomiting [1,2].Gastric ulcers occur due to the imbalance in the equilibrium between mucosal damaging (acid and pepsin) and protecting mechanism of the gastric mucosa. Acid secretion is a physiologically important function of the stomach, as gastric acid (HCl) induces pepsinogen activator that helps to initiate digestive process [3]. Gastric ulcers are caused by several factors like the over consumption of the nonsteroidal anti-inflammatory drugs such as aclofenac and nimesulide, steroidal drugs such as prednisolone, tobacco smoking, psychological stress, alternative lifestyle, and alcohol abuse [4]. Helicobacter pylori is the main cause of inflammation which causes damage to the gastric mucosa through excessive acid secretion from parietal cells by increasing the parietal cell mass due to its inflammatory effects on parietal cells of gastric mucosa [5]. Although H. pylori is the major cause for the development of ulcer, a number of investigations through the mechanism via H. pylori was established in the gastric environment and is also responsible for the pathogensis of gastric ulcer. Even though half

of the population of the world is affected by H. pylori only about 5-10 % of the population develop ulcer [6,7].

Some of the molecules with antiulcer activities are natural single molecule such as: curcumin which is a polyphenol isolated from the rhizome of curcuma longa. It is used as ayurvedic medicine against peptic ulcer and duodenal ulcer [8], cinnamic acid is an active ingredient in cinnamon, obtained from the inner bark of several tree species from the genus cinnamomum, and has shown anti-ulcer activity. In a recent study, protection against ulcer and gastritis by cinnamomi ramulus bark extract and cinnamic acid was shown in acid neutralizing capacity against H. pylori [9], thymol is a monocyclic monoterpene compound isolated from Thymus vulgaris L. The water extract of this herb protected gastric mucosa with the oral doses of 0.08 mg/kg when evaluated in Rainsford's cold stress ulcer model [10], menthol is a cyclic monoterpene alcohol, isolated from Mentha piperita L, which is commonly known as peppermint [11].

The plant products with exhibit antiulcer activities are: aloe has been used for millennium which is more like a cactus plant, growing in dry climates, containing compounds such as amino acids, saponins, enzymes, anthraquinones, flavonoids, gallic acid, and vitamins [12], carica papaya belongs to the family Caricaceae. The fruit of this plant contains papain which is responsible for anti-ulcer activity [13]. Hydroalcoholic extract of unripe fruit of carica papaya was evaluated in pylorus ligation induced ulcer model and the result showed reduction in the ulcer index [14], Zingiber officinale chemically contains resin. In recent studies, the aqueous extract of these plants (200 and 400 mg/kg) was applied in indomethacin-induced gastric damage in rats, and a significant percentage inhibition of gastric ulcer was observed [15], Mimosa pudica belongs to the family of Fabaceae, commonly known as "touch me not" and known as Lajjalu in Ayurveda. Different solvent extracts of M. pudica were used orally to exhibit anti-ulcer activity in albino rats, where ulcer was induced with alcohol and aspirin. The study showed that the plant has good anti-ulcer activity when compared with ranitidine. The ethanolic leave extract of this plant may be useful as a natural antioxidant in the treatment of ulcer. Alkaloid mimosine is active compound of this plant which was considered for anti-ulcer activity [16,17].

Nutraceuticals which contain antiulcer components are: garlic is a very common food material used, especially in India and China, obtained from Allium sativum belonging to the family Liliaceae. According to Ayurveda, the mustard or coconut oil in which garlic has been fried was a proper nutrient to avoid maggots infesting ulcer, ulcerated surface, and wounds, etc [18], banana whose benefits to human health have been promulgated for centuries. Banana belongs the family Musaceae is cultivated all over the world. It composed of a significant number of monomeric flavonoids, especially leucocyanidin, which is the active component possessing anti-ulcer action in indomethacin-induced ulcer model [19], honey is a natural nonplant food. Honey significantly reduced gastric acid when it was administered orally in combination with fenugreek seeds in rats against ethanol-induced ulcer model. It was observed that honey in combination with turmeric showed anti-ulcer activity in rats via antisecretory, antioxidant, and cellular protective mechanisms [20], cucumber belongs to the family Cucurbitaceae and contains Vitamin C, Vitamin K, linoleic acid, oleic acid, stearic acid, etc. It is cultivated in all over the world. The hydroalcoholic fruit extract of cucumber was given orally against pylorus ligation, indomethacin-, and ethanol-induced ulcer models in rats, which reduced total acidity and ulcer index via prostaglandin synthesis or blockade of back diffusion of H+ ions [21,22].

Omeprazole (OMZ), lansoprazole (LNZ), pantoprazole (PNZ), rabeprazole (RBZ) and esomeprazole (EMZ) belong to a class of antiulcer drugs. Various methods have been proposed for the determination of antiulcer drugs include: indirect argentometry [23], capillary electrophoresis [24], polarography [25-27], voltammetry [28,29], flow injection analysis [30,31] and high-performance liquid chromatography [32-37]. Simple methods based on UVvisible spectrophotometry have now a days become an accepted

analytical tool for the assay and evaluation of drugs.

Electroanalytical techniques have been used for the determination of a wide range of pharmaceutical preparations with advantages and in most instances, there is no need for derivatization and these methods are less sensitive to matrix effects compared to other analytical techniques [38]. However, these techniques have proved costly and cumbersome due to their high selectivity with regard to the solvent and the choice of the electrode material. Chromatographic methods are valuable for identification of impurities in preformulations or metabolites in biological matrices rather than routine quantitative analysis. Further, these methods need special equipment and their maintenance cost is high. Automated methods are economical only in case of large number of samples. But for routine analysis, spectrophotometric methods seem to be the most appropriate analytical approach. It is convenient and simple and can be relatively inexpensive.

Visible spectrophotometric methods are convenient, simple, sensitive and are relatively inexpensive. The spectrophotometric methods for the determination of antiulcer drugs employ different routes in the determination of chromogen produced and these are of four types. Type I method involves the oxidative coupling of the drug with an electrophilic reagent in the presence of an oxidant and measurement of the resulting chromophore [39]: method of type II involves the use of electron acceptor and the antiulcer drug as electron donar in which the resultant product is coloured molecular complex [40]. Type III method consists in the formation of a charge transfer complex between the drug and the reagent [40]. Finally, Type IV method is based on the use of a suitable oxidant to produce colour for the spectrophotometric measurement [41]. Methods of Type I, II, and III are lengthy; however, the method of Type IV although is simple and straight forward, but lacks selectivity as the coloured product is presumed to be the radical cation of the drug. Also, the above methods have not utilized a coordinated complex as a chromogen for the determination of antiulcer drugs. These deficiencies have encouraged the author to develop a simple, sensitive, rapid and reliable method for the determination of antiulcer

The work describes a new method for the determination of antiulcer drugs like OMZ, LNZ, PNZ, RBZ and EMZ which is based on the reduction of iron (III) to iron (II) by the drugs and subsequent complexation with 2,2' -bipyridine which produces a pink coloured product having a maximum absorption at 530 nm.

Experimental

Apparatus: UV-VIS spectrophotometer UVIDEC-610 type with 1.0-cm matched cell was employed for measuring the absorbance values.

Reagents:

Omeprazole (OMZ), lansoprazole (LNZ), pantoprazole (PNZ), rabeprazole (RBZ) and esomeprazole (EMZ), ammonium iron (III) sulphate and 2,2' -bipyridine were used. All the other chemicals and solvents were of analytical grade. Double distilled water was used throughout. Weighed (100 mg) samples of the drugs were dissolved in about 10.0 mL of alcohol and the solution was diluted with distilled water in 100-mL volumetric flask. The solutions were stored in a refrigerator and diluted daily to get the required concentrations. Aqueous solution of 0.001N ammonium iron (III) sulphate containing a few drops of dilute sulphuric acid and 0.2% (w/v) of 2,2' -bipyridine solution were prepared in doble distilled water and alcohol, respectively.

Procedure:

Assay with iron (III) and 2,2' -bipyridine: aliquots of standard solutions of OMZ, LNZ, PNZ, RBZ and EMZ were transferred into 25-mL calibrated flasks. To each of the flask was added ammonium iron (III) sulphate (2.0 mL) and 2,2' -bipyridine (2.0 mL). The flasks were kept in a boiling water bath (800C) for

10 mins and then cooled to room temperature (270C). After cooling the solutions were made up to the volume with distilled water. The absorbance of the pink colour was measured at 530 nm against the corresponding reagent blank and calibration graphs were constructed. The optical characteristics are presented in Table 1.

Pharmaceutical preparations

Twenty capsules each of omeprazole and lansoprazole were carefully emptied and the mass of the collected contents was determined. The capsule contents were finely powdered in a mortar. In case of pantoprazole, rabeprazole and esomeprazole twenty tablets each were finely powdered. An accurately weighed 50 mg of the powdered drug was dissolved in about 10.0 mL of alcohol and filtered through a Whatman No. 42 filter paper. The filtrate was made up to 100 mL wit distilled water in a volumetric flask. A suitable volume of the filtrate was accurately diluted with water so as to obtain a sample concentration of 10 μ g mL-1. An aliquot of this solution was treated as per the procedure described earlier for the determination of antiulcer drugs.

Results and discussion:

Omeprazole (OMZ), lansoprazole (LNZ), pantoprazole (PNZ), rabeprazole (RBZ) and esomeprazole (EMZ) belong to a class of antisecretory compounds. These compounds are acid labile and reversibly transformed in acidic medium to a sulphonamide [42]. They are referred to as proton pump inhibitors (PPI) being introduced for the management of duodenal ulcer, gastric ulcer or pathogenic hypersecretory condition [43]. Gastric PPI is a prodrug that requires an acid induced activation. It is a weak base that is converted to its active form by gastric acid before acting on the proton pump. It inhibits gastric acid secretion by covalently binding to the proton pump (H+/K+AT Pase)[44].

2,2'-bipyridine is a derivative of 1,10-phenantroline and it is used as a bacteriostatic, fungistatic, ant fibrillating agent, virus inactivator, paint and oil drier, enzyme inhibitor and activator, anthelmintic and bactericidal agent, polymerization agent, catalyst and electroplating agent. [45]. The method for the determination of antiulcer drugs involves the reaction of these drugs with iron (III) salts, in the presence of 2,2'-bipyridine to produce a pink colour with maximum absorption at 530 nm. The reaction involves the reduction of iron (III) to iron (II) by OMZ, LNZ, PNZ, RBZ and EMZ which subsequently reacts with 2,2'-bipyridine to give a pink colour product in neutral medium. Beer 'law limits, molar absorptivity, Sandel's sensitivity, regression equation and correlation coefficients obtained by least square treatment of these results are given in Table 1.

Parameters	OMZ	LNZ	PNZ	RBZ	EMZ
Beer's law (ng mL-1)	80.2800	200 4000	200-4000	200-	200-3800
	80-2800	200-4000		4000	
Recommended drug	1400	2000	2200	2000	2000
concentration (ng mL-1)	1400	2000			
Molar absorptivity (L mol-1	8 02×10 ⁴	6.22v104	6.05×10^4	5.80×10^{4}	6.73×10^4
cm ⁻¹)	8.03X10	0.52X10			
Sandell's sensitivity (µg cm ⁻²)	0.004	0.006	0.006	0.006	0.005
Regression equation*					
Slope (a)	0.2444	0.1219	0.1175	0.1291	0.2301
Intercept (b)	-0.0061	0.0484	0.0410	0.0022	-0.0410
Correlation coefficient	0.9988	0.9827	0.9790	0.9980	0.9865
R.S.D**	±0.79	±1.01	±0.63	±1.11	±1.05

Table 1: Optical characteristics of the antiulcer drugs as determined using 2,2'-bipyridine

*y=ax+b where x is the concentration of OMZ, LNZ, PNZ, RBZ or EMZ in ng mL-1 ** relative standard deviation(n=5) The pink colour developed in the method showed a maximum absorption (λ max) at 530 nm and it was found to stable for 24 hours.

Spectral Characteristics:

A pink coloured product with maximum absorbance at 530 nm was formed when OMZ reacts with ammonium iron (III) sulphate, in the presence of 2,2'-bipyridine in neutral medium.

Optimization of analytical variables

Maximum and constant absorbance values were obtained when the standard flasks were kept in a boiling water bath for 10 min after adding the reagents to the drug solutions which remained stable for 24 hours. It was found that 0.001 N ammonium iron (III) sulphate in the range 1.0-3.0 mL. 0.2%(w/v) of 2,2'-bipyridine in the range of 1.0-4.0 mL were necessary to get maximum intensity of colour and stability. Hence, 2.0 mL each of ammonium iron (III) sulphate and 2,2'-bipyridine were found appropriate.

The sequence of addition of ammonium iron (III) sulphate, 2,2'-bipyridine and drug solution was studied via the formation of the pink complex. Absorbance or colour of the product did not change appreciably when the order of addition of these reactants was varied. Table 1 shows the linear calibration ranges and equation parameters for different drugs. Separate determinations at different concentrations of each drug gave a coefficient of variation not exceeding 2%.

Stability

The development of the coloured product was slow at room temperature. The absorbance values were maximum and remained constant in the temperature range 80-1000C. However, after cooling to ambient temperature the products remained stable for 24 hours.

Interference

The effect of common ingredients usually present in pharmaceutical preparations was by taking omeprazole as a representative drug. Commonly encountered pharmaceutical additives and excipients such as glucose, lactose, dextrose, starch, sodium alginate and sodium lauryl sulphate did not interfere, while vitamin C was found to interfere seriously. The results are presented in Table 2.

Material	Amount(mg)	% Recovery of OMZ* ± RSD**
Glucose	50	100.6 ± 1.02
Vitamin B ₆	50	98.8 ± 0.78
Dextrose	50	99.6 ± 0.92
Gum acacia	50	101.4 ± 0.60
Starch	50	99.2 ± 1.14
Sodium alginate	50	99.0 ± 0.88
Talc	50	100.4 ± 1.06
Magnesium stearate	50	98.6 ± 0.72
Lactose	50	99.2 ± 1.16
Carboxyl methyl cellulose	50	98.6 ± 0.75
Vitamin C	50	# erratic values

Table 2: Recovery of omeprazole (OMZ) in presence of excipients and other substances

*1000 ng ml-1 of OMZ taken

** relative standard deviation(n=5)

Analysis of pharmaceutical formulations

Commercial formulations (capsules/tablets) containing OMZ, LNZ, PNZ and EMZ were subjected to analysis by the proposed method. The values obtained by the proposed and the reference methods for the pharmaceutical preparations were compared statistically using the F- and t- tests and no difference was found significantly. The results are summarized in Table 3.

Drug	Label		*Recovery	Additional	*Recovery	Reported method
	claim	(mg	% ±SD**	analyte	% ±SD**	found %
	per dr	ug)		added (mg)		
Omelac capsule	20		98.2 ± 0.68	20	99.2 ± 0.90	$97.2 \pm 1.09[41]$
(Omeprazole)			F=2.57(6.39)			(n=5)
			t=1.68(2.77)			
			(n=5)			
Lanpro capsule	15		99.5 ± 0.19	15	100.2 ± 0.62	$99.6 \pm 0.11[40]$
(Lansoprazole)			F=2.98(6.39)			(n=5)
			t=1.29(2.77)			
			(n=5)			
Pan tablet	20		99.2 ± 0.90	20	99.2 ± 0.90	$97.2 \pm 1.09[41]$
(Pantoprazole)			F=2.18(9.28)			(n=4)
			t=1.21(3.18)			
			(n=4)			
Rabeloc	20		99.0 ± 0.88	20	98.4 ± 1.08	$98.6 \pm 1.05[46]$
tablet			F=4.00(4.28)			(n=7)
(Rabeprazole)			t=1.63(2.44)			
			(n=7)			
Raciper	20		99.3 ± 0.63	20	100.8 ± 0.71	$96.5 \pm 1.11[41]$
tablet			F=2.07(4.67)			(n=5)
(Esomeprazole)			t=1.34(3.14)			
			(n=5)			

Table 3: Determination of certain antiulcer drugs in commercial samples by the proposed method using 2,2'-bipyridine

*Proposed method **standard deviation

The figures in the parentheses are the tabulated F- and t-values at 95% confidence level

Conclusion

Today, an extensive array of modern analytical techniques has been employed for pharmaceutical analysis. Nevertheless, spectrophotometry will survive even in the presence of purely instrumental approaches. The proposed spectrophotometric method provides accurate measurement for the determination of OMZ, LNZ, PNZ, RBZ and EMZ in pharmaceutical tablets. We hope that this recommended method using common reagent such as 2,2'-bipyridine and iron (III) salts is simple, sensitive, selective and cost-effective and thus it is well suited for the routine assay and evaluation of drugs in preformulation and dosage forms to assure high standard of quality control. Further, value-addition to this method can be achieved if the procedure is combined with on-line or at-line system and this is currently under investigation.

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A Comparative Study of Physical Fitness Component of Volleyball and Handball Players of Ellenabad Sirsa

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ABSTRACT

In sports, physical fitness is very important aspect to achieve the excellent game performance, particularly in handball and football. Such sports require a great fitness level achieved from great playing capacity and high skills. These games needed the technical and scientific foundation. Physical fitness is the potential to perform the routine jobs with dynamism without exhaustion. It needs the sufficient energy to occupy in leisure searches and to fulfil emergency conditions. Physical fitness is necessary for improved performance in sports. This research presents provides the assessment on physical fitness components of volleyball and handball players of ellenabad sirsa. This research has the base as physical fitness of players .The work assists the trainers and athletes to understand their fitness level as well as encourage focusing on their weakness on specific physical fitness attributes. This research also provide the guidance to trainers for making an appropriate training program that can enhance the players performance. This research additionally helps to understand the entire situation of Sirsa and how such conditions will impact on the level of physical fitness and performance of volleyball and handball players.

Introduction

Recently, researchers have the prime focus on physical education (PE) that has moved away from conventional game including a wider range of activities. Participants who are involved to sports such as hiking, walking, bowling, or Frisbee at the early age are more expected to gain lifelong practises of PE. Some instructor are using the Tai chi, deep- breathing, and yoga are few stress- reduction approaches. Conventional techniques highlight relaxed meditative movements that can be the excellent relaxation sources for pupils. Several research work have shown that such sports can enhance the flexibility, muscular strength and cardiovascular health of body The psychological health gets benefit also like improved attentiveness, concentration and a more upbeat nature. Also, physical fitness is essential from the early age of humans that can enhance the skill level without or less need of specialized equipment. The football and handball kind of sports can be an important part of well-rounded curriculum of education for both mind as well as body. In school level, student shows more interest to take part in sports apart from their non-traditional teaching curriculum. Nowadays, physical education becomes the most active and engaging discipline. Physical education has shown the exponential growth in fitness improvement especially in youngsters. Now, PE is accessible by anyone that has a wide range from primary school students to adults of entire age groups. In some last decades, PE becomes necessary for every school involving a diverse free-hand events, e.g. swimming, racing, walking etc. Government of India shows a keen interest after independence to launch several programs that assures the compulsory participation of students in PE. Throughout the entire globe, sports events are broadcast on large-scale. Several students like and seem happier to participate in games and other kind of physical activity that helps in maintaining the entire health of them. PE is a type of course especially designed for school

students highlighting the physical activity to enhance the human capability. Physical activities involve kicking, pulling, pushing, throwing, climbing, leaning, hopping, sprinting, running, jogging, walking, and many more significant body motions.

PE consists a well-proportioned technical activity session that reliant on the proper understanding of physiological philosophies of training. The past and present understandings on PE in addition with the careful assessment of an individual's flexibility to a standard training task must deliver an efficient structure for an intelligent activity programs development. Such concepts follow "Specific Adaptations to Imposed Demands (SAID)" that gives the importance to health related constraints. It represents a fact on human body that is tremendously adjustable in its potential to accommodate itself according to the several forms of pressures forced upon it (Tunås, Nilstad, and Myklebust, 2015). Although such adaptation is quite definite to the kind of pressure imposed. This concept discusses the importance of several activities that have various upon the human as neurological, metabolic, temperature regulating, respiratory and circulatory functions on the physical fitness. PE works on specially the three major attributes as physical, physiological and anthropometric aspects. Such can sustain the whole mechanism of physical fitness of human body. Several compensatory as well as co- ordinated modifications happen in the entire body in the course of physical exertion including the metabolic operations over the respiratory, circulatory, muscular and nervous systems. The link of fatness with high risk of developing cardio-vascular disease, diabetes, hypertension and even cancers as quite complicated health issues. Aggravating the issue is the understanding that it involves several aspects such as psychological and physiological association that induce obesity and innumerable constraints that may be beneficial in the obesity restriction.

1. Background

Handball is a trending and famous sport that includes a small rubber ball hit by fist/hand against a single wall or in contradiction of a wall in a walled court or against a single wall. The objective is acquire the ball to bounce back at an odd angle with different speed or strength, thus the rival team fail to return it. Handball is one of the oldest ball sports that showed its existence since the Roman baths. sport was the precursor of contemporary jai alai that was consequently played in France as well as Spain as a bare-handed game known as pelota. In the 16th century, the British Isles provided the recognition to handball. Handball was already played in Ireland nearly thousand year before the invention of existing form of handball. The Irish country and town tournaments were generally performed on courts having the dimensions of 80 × 40 feet in the 1850s using a hard leather-covered ball. Phil Casey in 1886, developed a walled court in Brooklyn, New York. In the 1880s, the Irish colon is carried this sport to the US. This permits for specific athletes to achieve an extraordinary potential to return low balls with their feet that was supported.

The first international tournament was conducted after the meeting of Casey of America and John Lawlor in 1887. In the 1890s, US first utilized the soft balls, usually a tennis ball uncovered of its external layering. Such ball was generally utilized in the court with four-wall having lesser players in the New York region. It was not long before young athletes begun to utilize a larger ball in contradiction of the building outside. Other cities started to implement the soft ball, majorly for four- wall game. Due to the athletes' dissatisfaction with the massive, sluggish ball, a reduced gas-filled ball was made, and resulted as the ignited renewed interest in the sport. In some cities such as Chicago, Milwaukee, Cleveland and Detroit, the four-wall softball sport became a trendhobby. Simultaneously, the strategies of the sport were changed and the court size was shorter. At the beginning of 1913, a in the New York City, one-wall game was designed instantly disperse around the eastern US. It was shifted within by

the Young Men's Christian Association and its allied groups/organizations when there was no more room outside.

In India, handball is one of the trending game and also is a part of Olympics due to the need for complete strength. Some of the Indian states such that Jammu and Kashmir, Himachal Pradesh, Haryana, Punjab etc. excellent centers of handball. Handball is a form of team sport that involves the sportspersons utilizing either their single or both hands for ball striking against a wall in an attempt to score goals. The ball needs to toss or pass by the hands in order to score a goal. In 1972, Rohtak District of Haryana conducted the initial Championship of Senior Men's National Handball sport. In that time, Haryana as well as Vidharbha both won the silver medals. Handball was a trending game around the world as well as in India since ancient times. A fresh coportraying this game was exposed in 1926 on the walls of Athens city. Based on a popular faith, the sport of handball, many centuries back to the year 600 B.C., a German gymnastics instructor named Konrad Koch, relaunched handball in 1890 to the world. The first introduction of contemporary handball to the people was made by west European coutries. During the 1928 Olympic summer games, the tournaments to demonstrate the handball games were performed just before this sport was legitimatelyaccepted in 1931 by the International Olympic Committee (IOC) Around the world, more than fifty nations even take participation in this sport. On December 4, 1946, IHF was established at a conference conducted in Copenhagen In early 1926, handball as an outdoor game were played in Berlin, while indoor sports with seven-a-side developed as the standard when handball were reestablished in Munich during 1972. Handball is not a male-dominated game in India; while it is correspondingly popular between women. Many female have made a name for themselves while playing for India at the state and national levels. It was not getting popular until 1976 where female handball tournament was first conducted. Football is also popularly known as soccer. It is the most popular game in Western countries especially in Europe and US. Every team has needed 10 players with 1 goalie that are always on the arena. The players are free to make complete body utilization except for the Football is targeted towards the goalposts of the rival squad. A goalie may just do it in the penalty zone next to the goal to tackle a football with his hand. In this competition, teams has to be a winner and a runner-up. This two teams have eleven players, attempt to acquire the ball from the other team's goal by using any body part excluding the arms/hands. Except the goalie, players are not permitted to touch the ball external of the penalty zone that settings the goal. At the end of a game, the team with the most goals wins the match. There are more people playing and watching football than any other sport on the planet. The sport's basic rules and equipment are so simple that it can be played practically anywhere, including football fields, gyms, streets, school playgrounds, parks, and even on the beach or in a park. There were approximately 250 million football players and 1.3 billion people who were "interested in football" at the turn of the 21st century, according to the Federation International de Football Association (FIFA). In 2010 more than 26 billion people watched football's premier tournament, the quadrennial month-long World Cup finals.

In India, several people like to play the football since childhood, especially in the western, eastern and northern parts. It quickly became popular between the individuals when the British authorities presented football to India. In 1854, the first game was arranged among the "Calcutta Club of Civilians" and "The Gentlemen of Barrackpore". Established in 1872, the very first football team is Calcutta FC in Indian history. Before switching to football, the Culcutta FC started as a rugby club in 1894 (based on reports). Some of the other Indian clubs are the Mohan Bagan Athletic Club (formed in 1889), the Naval Volunteers Club, the Traders Club and the Dalhousie Club that have been around since a very long time. Later on, the Mohan Began AC was formed from the 'National Club of India'. It wasn't until the 1930s that India"s first football association named as the Indian Football Organization (IFA), founded in Kolkata (then Calcutta), where it was established in 1893. The oldest Indian tournament named as the

Durand Cu football event i.e. also the third oldest in the world, was conducted in 1898 at Shimla. India's former foreign minister named Sir Mortimer Durand, inaugurated the tournament as well as offered it his name that has in trend ever since. Mohan Began AC in 1911 was the first ever Indian club to achieve the IFA-Shield Trophy that made the history in football. The honor was exclusively gained by British teams with an Indian foundation for a long time. The success is still observed as one of greatest achievement of Indian Football team.

After Mohun Bagan AC's IFA- Shield Trophy win, football teams/events thrived. All-India Football Federation (AIFF) in 1937 was established due to the high number of football clubs. In 1954, Asian Football Confederation (AFC) was established, whereas in 1948, the Asian Football Confederation (AIFF) was initiated. All of such activities are held as note worthy instants in Indian Football's history. From 1951 to 1962, it was known as the golden age of Indian Football, i.e. generally regarded as the most prosperous duration in the history of nation (Langevoort, Myklebust, Dvorak, and Junge, 2007). India won the gold medals held in Jakarta and New Delhi during the Asian Games of 1962 and 1951 and was the first Asian nation to reach the semi- finals of football in Olympic. For instance, in August 2007, the Indian football team won the Nehru Cup and has had many inspiring current performances. Due to this, AFC Challenge Club, the squad qualified in 2011 and win the tournament. Along with the Indian national team, numerous Indian football clubs have done well in main global tournaments. AIFF has registered the services of Bob Houghton to lead the national squad. The Indian team has gained from his associations with few of the best Asian teams. Brazil and India hit a traditional pact in 2006. The contract said that the two countries will function along for the better good of encouraging football (Rossing, Nielsen, Elbe, and Karbing, 2016).

2. Material & Method

Data Collection

The physical fitness has some significant attributes that was achieved from several approved tools/instruments operated by the researcher at the volleyball & handball grounds in many sirsa district. The trainers were completely collaborated and helped in taking measurement. Before the real examination, the participants were provided the whole demonstration of every test with its purpose with detailed description.

Subjects

The objective of this research work is attained by targeting male players of interstate by choosing random sampling approach from several Haryana districts who already took participation in state level tournaments. Previous approval was taken from the respective trainers as well as the entire participants regarding the aim and the process of data collection. The current research was performed on 200 males that were district level players out of which 100 were volleyball and 100 were handball.

Variables

All participants were medically fit as well as no recent history of cardio respiratory disorders, asthma and contagious ailments. Every participant provided their written permission as well as the local ethics commission accepted the research protocol. All participants were evaluated for the anthropometric variables including body composition attributes measurement utilizing the standardized process mentioned by the International Biological Program (IBP) guidelines concerning the fundamental principles/rules associated to the standard measuring tools, measurement techniques, standard

conditions and parameter choice, accustomed before the measurement was performed. In a laboratory, weight and height were taken with participant dressed in light clothing. A fixed stadiometer can take the height was taken to the close of 0.1 cm and a standard scale using a portable balance can measure the weight the close 0.1 kg.

The measurement of skin fold (mm) was taken from six sites by using skin fold calliper such as abdominal skin fold thickness, chest skin fold thickness, calf skin fold thickness, thigh skin fold thickness, forearm skin fold thickness and triceps skin fold thickness. The eight sites were chosen for the circumferences (cm) measurement by using an anthropometric tape such as maximum/minimum lower leg and upper leg circumference as well as maximum/minimum lower arm and upper arm circumference. In addition, the test was conducted by doing 12 min. run and walk, 50 yard dash, shuttle run, standing broad jump, bent knee sit ups and pull ups.

Statistical Analysis

Data achieved from this study was analysed by utilizing SPSS Statistics 20.0 software, modified to be used on a laptop. Evocative measurements was utilized to measure the standard deviation and mean for every attribute. T-test and the LSD Post Hoc examination were performed to identify the impacts of each sport type (handball and volleyball) on every attribute such as body fat, bone content, muscle mass, body mass index (BMI), weight and height as well as to observe them in participant referring common population. The significance was set 0.05 of an alpha level. the physical fitness in handball and volleyball male players of ellenabad sirsa. The assessment was made on considering the 100 handball players and 100 volleyball players of ellenabad sirsa by imposing the "t" test to obtain the mean and standard deviation as descriptive statistics.

3. Results & Discussion

Sr. No.	Variable	Group	N	Mean Score	S.D.'s	t-value
1	12 Minute	Volleyball Players	100	2634	280.88	6 712**
1.	Running	Handball Players	100	2100	140.71	0.715
2.	50 Yard	Volleyball Players	100	7.18	0.48	6.713**
	Dash	Handball Players	100	7.64	0.49	
3.	Chuttle mun	Volleyball Players	100	10.08	0.60	6.316^{*}
	Snuttle run	Handball Players	100	9.64	0.36	
4.	Standing	Volleyball	100	2 23	0.36	3.635**
	Broad	Players		2.25	0.50	
	Jumps	Handball Players	100	2.37	0.17	
5.		Volleyball	100	24.41	2 71	11.130**
	Sit-ups	Players		24.41	5.71	
		Handball Players	100	33.70	7.47	
6.		Volleyball	100	5.65	1.855	14.297^{**}
	Pulls-up	Players				
	-	Handball Players	100	9.93	2.349	

The current research work was performed with the objective to measure







Fig. 2 Graphical representation of 50 Yard dash of volleyball and handball players of ellenabad sirsa



Fig. 3 Graphical representation of shuttle run volleyball and handball players of ellenabad sirsa





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Fig. 5 Graphical representation of sit-ups volleyball and handball players of ellenabad sirsa



Fig. 6 Graphical representation of pulls-up volleyball and handball players of ellenabad sirsa

As shown in Fig.1, the mean scores of 12 minute running of handball/football Harvana players is significant at 0.01 level. In this condition, the null hypothesis that "There will be no significant in volleyball/handball endurance ellenabad of sirsa players" is rejected. As shown in Fig. 2, the mean scores of 50 yard dash of volleyball/handball ellenabad sirsa players is significant at 0.01 level. In this condition, the null hypothesis that "There will be no significant difference in speed of volleyball/handtball ellenabad sirsa players" is rejected. As shown in Fig. 3, the mean scores of shuttle run of vollevball/handball ellenabad sirsa players are significant at 0.01 level. In this condition, the null hypothesis that "There will be no significant difference in agility of volleyball/handball of ellenabad sirsa players" is rejected. As shown in Fig. 4, the mean scores of standing broad jumps of volleyball/handball ellenabad sirsa players is significant at 0.01 level. In this condition, the null hypothesis that "There will be no significant difference in strength of volleyball/handball ellenabad sirsa players" is rejected. As shown in Fig. 5, the mean scores of sit-ups of volleyball/handball ellenabad sirsa players is significant at 0.01 level. In this condition, the null hypothesis that "There will be no significant difference in flexibility of volleyball/handball ellenabad sirsa players" is rejected. As shown in Fig. 6, the mean scores of pulls-up of volleyball/handball ellenabad sirsa player is significant at 0.01 level. In this condition, the null hypothesis that "There will be no significant difference in strength of volleyball/ handball ellenabad sirsa player" is rejected

4. Conclusion

In conclusion, the present research provides the outcomes to validate that the handball players are relatively better than volleyball players of ellenabad sirsa. Handball players are better than volleyball players in terms of strength, flexibility agility. On the other hand, volleyball players are better than handball players in terms of endurance and speed. Such depicts that steady energetic action can leads to physical fitness enhancements. The result of this research will act as supervision to hand-picked a better handball/volleyball players. The outcomes of the study will be a crucial aspect for sports trainers, PE instructors and coaches to design their training program for such handball/volleyball that requires the development to physical fitness variables as the significant constraints. The outcomes of the forth coming examines in the part of athletics for physical fitness.

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Competency-Based Job Performance of Higher Education Institution's Personnel: Human Resource Management

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ABSTRACT

Job competency is a significant foundation of work performance. The study examines the profile and determines the job competency level of the faculty, non-teaching employees and job order employees of Cebu Technological University- San Francisco Campus for the academic year 2016-2017. The job competency level is based in terms of accounting and administrative competencies, planning and development competencies, Human Resource Management and development competence, behavioral human competencies, organizational core competencies and supervisory managerial competence using the job competency assessment tool developed by the Human Resource Management Office. Results showed that the personnel job profile in terms of length of service ranges from 21-25 years for the teaching personnel, 11-15 for non- teaching and 1-5 years for the contractual workers. Ranks of the teaching faculty are mostly Instructor 1 followed by Assistant Professor 1 with one University Professor, the highest in rank. For the non-teaching personnel most of them were Admin Aide 1 and for the job order workers were mostly office assistant job description. Competency level of all the employees in terms of accounting and administrative, planning and development, Human Resource Management and development, organizational core behavioral competence, human, and supervisory managerial competence ranked as moderately competent by the There is a need to further improve their competency skills in the workplace.

Keywords: Job Competency, Training Development Plan, Descriptive Survey Method, Competency Level, human resource management, job competency assessment tool

Introduction

Job competency is a significant foundation of work performance. Competencies include a range of characteristics, behaviors and traits necessary for successful job performance (Noor and Dola, 2009). In Higher Education Institutions (HEIs) competency levels and skills were one of the measures on the performance of faculties and even the teaching personnel. Competency is also used as a more comprehensive description of the requirements of human resources in organizations. Competency-based practices are among those integral tools for selection, retention, and development of the human resources in the institution (Noor and Dola, 2009). Competency guidelines were created in organizations which are used in creating job functions. Competency models were also made as useful tool in facilitating and of institutional goals and strategies.

Competency-based Human Resource Management prioritizes ways of transforming job competences as building blocks for all human resource efforts instead of job descriptions. These key competencies are important for being competitive in the workplace (Prahald and Hamel, 2000). However, an individual need to invest his/her resources in acquiring competencies based on three ways of knowing which have been regarded as the critical aspects of career competency in the modern career environment (Suutari &

Mäkelä, 2007). These career competencies are the critical predictors of many work performance aspects in various research settings (Zikic & Ezzedeen, 2015). These three ways of career competencies are knowing how and work performance, knowing whom and work performance and career competency and work performance. All these competencies were found out to have significant relationships with perceived individual work performance (Arthur et al., 2017). Competency-based system combines the organization and personal goals (Grissom, 2009). Performance level and competency skills will be measured particularly in the Higher Education Institution (HEI) to where they contributed much on the success of the mission and vision of the school.

Employee performance improvement represents the achievement of certain work or task. Performance is an expression of the intervention into knowledge, skill and ability in order to increase the tangible and measurable productivity. Employee performance can be measured into different indicators such as (1) work quantity, (2) work quality, (3) dependability, (4) accountability to the work, and (5) punctuality in finishing the work. These indicators are adopted from Mahmudi's Theory (2007).

Performance assessments and evaluation are tools that measure what employees actually do in their working environment. These are also been found to be related to employee's effectiveness and are a much more potent tool for evaluating employees' competence, satisfaction and readiness (Sabaityte, 2016). Performance assessment serves as benchmark in propelling workers in the job. The effectiveness is also a concrete tool for the evaluation of worker's competencies. In universities, employees both teaching and non-teaching personnel and job order workers really differ as to their competencies due to nature of work, educational qualification and many considerable factors. With this, the study wanted to find out the job competency level of the employees of Cebu Technological University- San Francisco Campus based on the job competency assessment tool developed by the Human Resource Management Office as basis for training plans and salary scaling personnel.

Methodology

The study used an assessment tool developed by the human resource management office (HRMO) for the evaluation on job competencies of worker or employees. There is a total of 59 respondents composed of 26 teaching personnel, 17 non-teaching and 16 job order or contractual employees of Cebu Technological University-San Campus. A Likert scale was used to give quantification of the responses of the respondents in the statement of the job competency assessment tool with rating of high, moderate and low on the described competency indicators.

RESULTS AND DISCUSSIONS

The profiles of the respondent were presented below in terms of age, sex, years in service and position. These factors are considered for this will show their profile and hence affected by the level of their job competencies.

Age and Gender Profile of the Employees									
Age Range	Teaching		%	Non-teaching		%	Job order/		%
	per	sonnel		per	sonnel		contr	ractual	
	Male	Female		Male	Female	-	Male	Female	
20-25	0	1	3.85	0	0	0	3	7	62.5
26-30	3	0	11.54	0	1	5.88	0	4	25
31-35	4	2	23.08	2	0	11.76	0	1	6.25
36-40	1	0	3.85	2	2	23.53	0	0	0
41-45	1	3	15.38	1	0	5.88	0	0	0
46-50	1	2	11.54	2	0	11.76	0	0	0
51-55	1	2	11.54	1	3	23.53	0	1	6.25
56-60	0	2	7.69	1	2	17.65	0	0	0
60 above	2	1	11.54	0	0	0	0	0	0
Total	13	13	100	9	8	100	3	13	100
Average									
Age:	45	42		46	45		23	36	

Table 1

Age and gender profile are variables identified to have effects on job satisfaction. As presented in many empirical studies on job satisfaction of workers, results have suggested that female workers have lower level of job satisfaction than their male counterparts because male officials dominate most of the public organizations (Ellickson and Lodgsdon, 2001). Furthermore, worker's age has been found to have a negative impact on worker's job satisfaction because younger workers are more satisfied with their jobs than their senior counterparts.

Furthermore, it was found that male teaching personnel of CTU- San Francisco Campus with age ranges from 31-35 got the highest percentage of 23.08% followed by males (ages 26-30) and females (ages 41-45) that got 11.54% and 15.38 respectively. This implies that the respondents in the teaching staff are still active and with high job satisfaction. As indicated in the result three (3) respondents are now in the retirement age of 60 and above that means to separate in the service. Contrary with the non-teaching personnel, female ages 51-55 years old got the highest frequency of three (3) with a percentage of 23.63% but male personnel got the highest number of nine (9) than female ones. For job order or contractual employees, is mostly composed of female ones (13) than males (3). This means that more female workers are able to get hired as contractual than male ones.

Table 2: Length of Service of the Employees at CTU-San Francisco Campus								
Length of	Teaching	%	Non-teaching	%	Job order/	%		
Service	personnel		personnel		contractual			
Less than a	2		0	0	1	6.25		
month		7.69						
1-5 yrs	4	15.38	4	23.53	14	87.5		
6-10 yrs	2	7.69	2	11.76	0	0		
11-15 yrs	4	15.38	4	23.53	0	0		
16-20 yrs	4	15.38	1	5.88	0	0		
21-25 yrs	5	19.23	0	0	0	0		
26-30 yrs	2	7.69	2	11.76	1	6.25		
31-35 yrs	1	3.85	2	11.76	0	0		
36-40 yrs	2	7.69	2	11.76	0	0		
Total	26	100	17	100	16	100		

Table 2. Length	of Service of th	e Employees at	CTIL-San	Francisco Campus
Table 2. Lengui	of service of the	e Employees at	C10-3aii	rrancisco Campus

Length of service accounts for the job performance of an employee. As indicated in the results of the study it was found that 21-25 years of service got the highest of 19.23% and the lowest is 31-35 years of service with 3.85%. Studies further show that teachers had the greatest productivity gains during the first few years on the job, after which their performance tends to level off (Boyd et al. 2007). Furthermore, other research shows that, on average, teachers with more than 20 years of experience are more effective than teachers with no experience, but are not much more effective than those with 5 years of experience (Ladd, 2008). Result implies that faculty members' length of service may have impact on job satisfaction and job competencies. In the part of the non- teaching personnel 1-5 years and 11-15 years of service in the job got the highest of 23.53% with lowest on 16-20 years (5.88%). And for the contractual workers, results showed that workers are new in their job since most of them render 1-5 years of service. Job position and or job assignment of a public official is another factor or variables that affect job competency and satisfaction. Public officials have many different interests, and these are sometimes satisfied on the job. However, the more public officials find that they can fulfill their interests while on the job, the more satisfied they will be with those jobs (Creswell, 2003).

F	D
Frequency	Percentage (%)
9	34.61
1	3.85
2	7.69
3	11.54
2	7.69
2	7.69
2	7.69
0	0
0	0
2	7.69
1	3.85
1	3.85
1	3.85
26	100
	Frequency 9 1 2 3 2 2 2 2 0 0 2 1 1 1 1 2

As indicated in the table, the teaching personnel or faculty members are mostly with the position or rank of Instructor 1 (34.61%) followed by Assistant Professor 1 (11.54%). This implies that the teaching staff needs to be more engaged and upgrade their professional level of professional competence or rank as it is the highest rank position of a university teaching personnel. rank to have higher competency level in the fields since Instructor 1 is the lowest level of professional rank or job position in the teaching profession of a university institution. Furthermore, a University Professor in rank got a percentage of 3.85 that means a high

Job Position	Frequency	Percentage (%)
Admin. Aide 1	4	23.53
Admin. Aide 4	1	5.88
Admin Aider 4	2	11.76
Administrative Officer	2	11.76
Admin. Asst. 3	1	5.88
College Librarian 1	1	5.88
Registrar 2	1	5.88
Nurse 2	1	5.88
Guidance Counselor 3	1	5.88
Farm Worker 2	1	5.88
Watchman 1	2	11.76
Total	17	100

Table 4: Job Position of the Non-Teaching Personnel at CTU- San Francisco Campus

As indicated for the job position of the non- teaching personnel of the university, position of Admin Aide 1 got the highest in frequency of four (4) which is 23.53%. The positions in the non-teaching personnel are the workers important to fill in as university status institution to work on and to cater services to different stakeholders or clients. Further, the job competency of the workers should be in relation to their job position as it is very important in the field they are working.

Table 5: Job Position of the Job Order/ Contractual at CTU- San Francisco Car	npus
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Job Position	Frequency	Percentage (%)
Office Assistant	12	75
Chief Cook	1	25
Library office assistant	1	6.25
Canteen in- charge	1	6.25
Job order	1	6.25
Total	16	100

Table 5 shows the job position that comprises the contractual workers. These workers are not regular employees and anytime in their job, they can be separated for any means or as of the end of their contract terms signed. as indicated in the table, office assistant comprises the largest (75%) job position filled in as these are needed in the different offices or departments of the institution.

Table 6: Accounting and Administrative Competencies of the CTU- San Francisco Campus Employees (n=59)

	Level of Accounting and Administrative Competencies						Total
CTU Employees	Low scale	%	Moderate scale	%	High scale	%	
Teaching Personnel		19.23	16	61.54	5	19.23	26
(n=26)	5						
Non- Teaching		11.76	10	58.82	5	29.41	17
Personnel (n=17)	2						
Job Order/Contractual		0	11	68.75	5	31.25	16
(n=16)	0						
TOTAL	7	30.99	37	189.11	15	79.89	56

Table 6 shows the level of competency in terms of accounting and administrative work of the employees. It shows that all the employees rated moderate (37) followed by high rating (15) in terms of accounting and administrative skills. Accounting competencies deals with the system of the skills in recording and analyzing reports, principles in financial transactions in relation to the job position they are assigned. For the administrative competencies it deals primarily on managerial with the duties and assignment they are in.

Employees							
	Level of Planning and Development Competencies						Total
CTU Employees	Low scale	%	Moderate scale	%	High scale	%	-
Teaching Personnel		15.38	19	19.08	3	11.54	26
(n=26)	4						
Non- Teaching		5.88	13	76.47	3	17.65	17
Personnel (n=17)	1						
Job Order/Contractual		12.5	9	56.25	5	31.25	16
(n=16)	2						
TOTAL	7	33.76	41	151.8	11	60.44	59

Table 7: Planning and Development Competencies of the CTU- San Francisco Campus

Table 7 presents the planning and development competencies where it deals mostly on achieving something useful or valuable in the workplace and the act of creating something new or becoming advanced in their job or field. As indicated in the study it was found that the employees were having a rating of moderate level of the competency with a frequency of 41 followed with a high rating scale of 11. This further means that the employees are moderately competitive in the field of planning and development field.

Francisco Campus Employees							
	Level of Human Resource Management and Development						Total
			Compete	encies			
CTU Employees	Low	%	Moderate	%	High	%	-
	scale		scale		scale		
Teaching Personnel		30.77	15	57.69	3	11.54	26
(n=26)	8						
Non- Teaching		17.65	12	70.59	2	11.76	17
Personnel (n=17)	3						
Job Order/Contractual		37.5	6	37.5	4	25	16
(n=16)	6						
TOTAL	17	85.92	33	165.78	9	48.3	59

Table 8: Human Resource Management and Development Competencies of the CTU- San

Table 8 presents the human resource management and development competencies and employees are moderately competent (33) followed by low level that comprises 17 out of 59 employees that rated the scale. Furthermore, the job order workers are with low rating that got equal with moderate rating. This means that they need more seminars related to development of human relations and its ways in dealing with the competencies. Human resource management and development competencies deal with the skills in developing better interpersonal and intrapersonal relations and adjustments. It is further a way of dealing group of people in the organization.

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	Level of Behavioral Human Competencies					Total	
CTU Employees	Low	%	Moderate	%	High	%	-
	scale		scale		scale		
Teaching Personnel		30.77	12	46.15	6	23.08	26
(n=26)	8						
Non- Teaching		5.88	13	76.47	3	17.65	17
Personnel (n=17)	1						
Job Order/Contractual		18.75	11	68.75	2	12.5	16
(n=16)	3						
TOTAL	12	55.4	36	191.37	11	53.23	59

Table 9: Behavioral Human Competencies of the CTU- San Francisco Campus Employees

Behavioral human competencies deal with actions relating or involving the way a person or worker respond to the co-workers and human relations. As presented in the table the workers or employees are moderately competent in the skills of behavioral human relations.

Table 10: Organizational/Core Competencies of the CTU- San Francisco Campus Employees

	Level of Organizational/Core Competencies						Total
CTU Employees	Low	%	Moderate	%	High	%	-
	scale		scale		scale		
Teaching Personnel		11.54	19	73.08	4	15.38	26
(n=26)	3						
Non- Teaching		5.88	11	64.71	5	29.41	17
Personnel (n=17)	1						
Job Order/Contractual		18.75	12	75	1	6.25	16
(n=16)	3						
TOTAL	7	36.17	42	212.79	10	51.04	59

In the organizational core competencies CTU employees got moderately competent with a frequency of 42 out of 59 employees. This means that they are moderately competitive enough in terms of planning and arranging of events and works related to their jobs.

		H	Employees				
	Level of Supervisory/Managerial Competencies					Total	
CTU Employees	Low	%	Moderate	%	High	%	-
	scale		scale		scale		
Teaching Personnel		11.54	20	76.92	3	11.54	26
(n=26)	3						
Non- Teaching		17.65	10	58.82	4	23.53	17
Personnel (n=17)	3						
Job Order/Contractual		18.75	11	68.75	2	12.5	16
(n=16)	3						
TOTAL	9	47.94	41	204.49	9	47.57	59

Table 11: Supervisory/ Managerial Competencies of the CTU- San Francisco Campus

Out of 59 employees it was found out that 41 of the employees got moderately competent in the level of supervisory and managerial competencies. This competency deals with the skill of operation and management of work.

Conclusions

A highlight in the study conducted was that the level of job competency of all the employees: teaching personnel, non-teaching personnel and job order or contractual workers are rated with moderately competent level in the Human Resource Management Office assessment tools in the field of Accounting and administrative competencies, Planning and development competencies, Human Resource Management and Development Competence, Behavioral Human Competencies, Organizational core competence, and Supervisory Managerial competencies.

Recommendations

A training development plan in all the competencies of accounting and administrative competencies, Planning and development competencies, Human Resource Management and Development Competence, Behavioral Human Organizational core Competencies, competence, and Supervisory Managerial competencies will be conducted since the employees are rate only with moderate level of job competency. Furthermore, the specific low level of the employees is on Human Resource Management and Development Competence which in return will be given emphasis and first to implement. Moreover, job satisfaction level of employees in their job assignment can be studied for determining their satisfaction level in terms of job description in order to improve performance.

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Assessing Entrepreneurial Aspirations and Self-Perceived Competencies in Transient Workers

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<u>ABSTRACT</u>

This research explores entrepreneurial aspirations among temporary workers, focusing on their inclination to view entrepreneurship as a viable career path. Central to this study is assessing how these workers perceive their entrepreneurial skills. Engaging a sample of 184 temporary workers, we employed multiple correspondence analysis (MCA) to delineate profiles of entrepreneurial competencies entrepreneurial concerning and openness their entrepreneurship as a career choice. Findings reveal a varied perception among temporary workers regarding their entrepreneurial competencies, influencing entrepreneurial intentions and willingness to consider entrepreneurship as a career. Many temporary workers do not view themselves as adequately equipped with the necessary competencies for an entrepreneurial journey. This study highlights the diversity in self-assessed entrepreneurial skills among temporary workers and how they correlate with their career aspirations and intentions. The insights gained offer valuable implications for individual and organisational strategies to foster entrepreneurial competencies.

Keywords: Entrepreneurial Skills, Career Aspirations, Temporary Employment, Entrepreneurial Aspirations, Workforce Development.

Introduction

Sullivan and Baruch (2009) observe that stable environmental factors and hierarchical organisational structures have largely influenced traditional career trajectories. This model assumed a continuous exchange between employers and employees within a growing economy. However, recent shifts in the labour market have altered these dynamics. York and Venkataraman (2010) emphasise the increasing demand for entrepreneurial activities as critical drivers of innovation and job creation in society. Given the evolving work environment where stability and predictability are no longer assured, entrepreneurship is emerging as a viable alternative. This shift challenges individuals to adopt entrepreneurial roles and organisations to foster an entrepreneurial spirit.

Man, Lau, and Chan (2002) highlight that entrepreneurial competencies—the comprehensive ability to execute entrepreneurial activities successfully—are crucial in this context. Besides these competencies, the intention and willingness to pursue entrepreneurship are also essential. Understanding whether current labour market participants view entrepreneurship as a feasible option is significant. Moreover, organisations' recruitment and selection policies must align with these new paradigms to integrate entrepreneurial strategies into their management practices.

The assessment competencies in of job entrepreneurial applicants is increasingly relevant for recruitment and selection strategies and policy programs. These programs equip individuals with the skills and mindset needed to enhance their entrepreneurial orientation and employability in a rapidly

changing job market. Galais and Moser (2009) and Kraemer, Wayne, Liden, and Sparrowe (2005) have documented the growing trend of temporary work contracts, where organisations outsource the workforce without direct employment responsibilities. This shift, part of the broader changes in the labour market characterised by instability and unpredictability, has led to mixed perceptions among temporary and permanent workers, often skewing negativity. On the other hand,Kerr and Armstrong-Stassen (2011) and Meher and Sahoo (2008) discuss entrepreneurship as a potent economic mechanism that generates jobs and enhances job satisfaction. This opens up the possibility of entrepreneurship being a viable next step in the career paths of temporary workers.

This article delves into how temporary workers perceive their entrepreneurial competencies, intentions, and willingness to pursue entrepreneurship. We examine the individual profiles of entrepreneurial competencies related to different intentions and the inclination towards entrepreneurship as a career option. Given the rise of temporary workers in the labour market, understanding their perceptions of competencies is crucial. Galais and Moser (2009) noted that temporary workers are increasingly cognizant of the labour market's instability. This awareness positions them uniquely in the current employment landscape, not just as precarious workers but as new entities within the evolving norms of working contract regulations. Therefore, it is essential to consider whether temporary workers view their career from a lifespan perspective or see entrepreneurship as a potential path, particularly in forms like selfemployment. However, a gap exists in understanding how temporary workers perceive their entrepreneurial competencies within their occupational journeys.

In this pioneering study, we explore the perceptions of temporary workers regarding entrepreneurship and their capabilities to undertake entrepreneurial endeavours as a career choice. This research adopts a novel perspective on careers, viewing them as occupational paths where entrepreneurial competencies play a crucial role. This approach sheds light on the evolving nature of careers in the modern labour market and the significance of entrepreneurial skills. Our investigation aims to deepen the understanding of how temporary workers assess their entrepreneurial potential and consider entrepreneurship a viable path in their professional development.

Redefining Career Trajectories: Understanding the Shift in Career Dynamics

The concept of a career has undergone significant transformation from its traditional roots, characterised by stability and linear progression, to a more dynamic and individual-focused approach. This shift is primarily attributed to changes in the labour market, as Baron (2012) noted, and the evolving organisational context described by Baruch (2006). The earlier career models, such as Super's (1957) traditional linear progression, emphasised extrinsic rewards and stability within one or two organisations. However, technological advancements, globalisation, and socio-economic shifts have altered organisational structure and employee expectations.

Sullivan and Baruch (2009) discuss the traditional model of careers as a mutually beneficial exchange of loyalty for job security. Nevertheless, Schein (1990) pointed out that the evolving needs of both organisations and employees have led to new career models. He introduced the concept of 'career anchors,' emphasising the alignment of personal competencies, needs, and values with professional choices. Similarly, Hall (1996) and Briscoe and Hall (2006) conceptualised the 'protean career,' centring on self-directed career management and self fulfilment. Arthur and Rousseau (1996) further expanded the career concept to encompass a range of opportunities beyond a single organisation, focusing on the employee's mobility across various employment situations.

Greenhaus, Callanan, and DiRenzo (2008) defined three components of a boundaryless career:

multidirectional mobility, career competencies, and protean orientation, identifying personal and economic factors as crucial influencers of career orientation. The notion of careers becoming increasingly independent of organisations is further supported by Granrose and Baccili (2006), leading to the concept of career profiles by Briscoe and Hall (2006), which posits the identification of potential career paths based on an individual's propensity for protean or boundaryless careers.

This evolution from organisation-centric to individual-centric career perspectives is evident in the literature, moving from the organisational focus of Sullivan and Baruch (2009) and Super (1957) to the individualcentred views of Arthur and Rousseau (1996), Briscoe and Hall (2006), Greenhaus et al. (2008), Hall (1996), and Schein (1990). In this context, individuals increasingly take responsibility for managing their careers and employability. In this article, we define a career as an occupational path comprised of individual choices encompassing throughout various life, occupational possibilities. Entrepreneurial intentions and activities, such as venture creation or selfemployment, are seen as choices within this occupational journey, potentially transitional and not necessarily indicative of long-term engagement in entrepreneurial activities.

Lippmann (2008) and Krieshok, Black, and McKay (2009) have pointed out the evolving nature of the labour market, where the major challenge is the unpredictability of employment, impacting workers across various sectors. The shift from a traditional match-based employment approach to adapting to continuous change reflects the current labour market dynamics. Temporary work emerges as a response to this instability, characterised by flexible employment conditions. Temporary workers, as described by Kraemer, Wayne, Liden, and Sparrowe (2005), lack ongoing employment contracts and are often hired through agencies responsible for their contract management and recruitment, a trend noted by Kalleberg (2000) and Aletraris (2010) as on the rise.

Despite their growing presence in the workforce, temporary workers typically experience lower job satisfaction levels than permanent employees, who often view them as threatening their job stability (Kraemer et al., 2005). Galais and Moser (2009) further observed that the nature of their contracts influences the commitment levels of temporary workers. This situation indicates that while reacting to the changing work environment, temporary work might not be the most favourable solution for either workers or organisations. The rapid increase in temporary contracts might be outpacing the ability of workers to adapt and develop necessary competencies, leading to job insecurity and periods of unemployment.

Schjoedt and Shaver (2007) propose that developing entrepreneurial competencies and activities like self-employment could be a more sustainable alternative in a labour market with transient occupational paths. Owning a business could potentially enhance job satisfaction and commitment. However, it raises questions about whether temporary workers view entrepreneurship as a viable career path and if they feel equipped with the necessary competencies for such endeavours.

Entrepreneurship as a Career Path and the Role of Competencies

Entrepreneurship, fundamentally rooted in recognising and capitalising on business opportunities, plays a crucial role in the labour market (Baron, 2006; Shane, 2012; Shane & Venkataraman, 2000). As defined by Reynolds et al. (2005), entrepreneurs are actively involved in setting up or managing a business they partly or wholly own. According to Korotov, Khapova, and Arthur (2011), this concept of entrepreneurship often represents an unconventional career move in the modern labour market. It is seen as a distinct path where success is measured by achieving a career in the chosen field (Mainiero & Sullivan, 2005; Sullivan, Forret, Mainiero & traditional career, it aligns with the kaleidoscope career model (Mainiero & Sullivan, 2005). Sullivan et al. (2007) note that entrepreneurs craft their careers outside the

traditional employment framework, balancing authenticity, balance, and challenge - the core elements of the kaleidoscope career model. Politics (2008) highlights that entrepreneurial careers are shaped by experiences such as start-up involvement, management roles, and industry-specific knowledge, which contribute to entrepreneurial learning and opportunity recognition. Additionally, entrepreneurship is often equated with self employment (Kenney & Mujtaba, 2007; Levenburg & Schwarz, 2008; Salimath & Cullen, 2010; Verheul, Thurik, Grilo & Zwan, 2012), requiring intrinsic motivation and specific competencies.

Kristof-Brown, Zimmerman, and Johnson (2005) suggest that career choices, including entrepreneurship, are influenced by personal alignment with one's skills, values, and interests. Baron (2012) asserts that individuals are drawn to entrepreneurship when they perceive a match between their competencies and the entrepreneurial role. However, Brice and Nelson (2008) argue that perceptions of the rewards associated with entrepreneurship significantly career intentions. influence While factors like independence and vocation are crucial, financial rewards and self-fulfilment remain primary motivators (Kerr & ArmstrongStassen, 2011; Meher & Sahoo, 2008; Schwartz & Malach-Pines, 2007). Douglas and Shepherd (2002) further showed that risk tolerance and a desire for independence positively influence entrepreneurial intentions, indicating a strong correlation between self-perceived competencies and entrepreneurial career paths (Higgins, Smith & Mirza, 2013; Jain & Ali, 2013).

Given the importance of self-perceived competencies in entrepreneurship, our study aims to understand how different perceptions of entrepreneurial competencies relate to the intention and willingness to pursue entrepreneurship as a career path, especially among temporary workers. This group, characterised by diverse professional experiences and employment types, reflects the changing nature of today's labour market. We examine temporary workers' entrepreneurial intentions, willingness to consider entrepreneurship, and selfperceived competencies, exploring how these factors influence their career choices.

Methodology and Participant Profile

1. Participant Demographics: The study involved 184 temporary workers affiliated with a temporary work agency in Portugal.

2. Survey Completion: Participants completed a survey to evaluate their career perspectives entrepreneurial competencies. and

3. Survey Duration: The survey took approximately 25 minutes for each participant.

4. Data Collection: The survey collected comprehensive data, including participants' demographic information (age, gender), educational background, experience in identifying business opportunities, and their intentions and willingness to engage in entrepreneurial activities.

5. Demographic Breakdown: Details of participants' demographic profiles, such as age, gender, and educational qualifications, provided in Table 1 of the study.

6. Purpose of Study: This participant profile aims to offer a diverse perspective on the entrepreneurial mindset and competencies among temporary workers in the Portuguese labour market.

7. Focus on Entrepreneurial Intentions: The study particularly emphasises understanding temporary workers' entrepreneurial intentions and willingness to engage in such Evaluation Methods.

Assessing Entrepreneurial Aspirations and Perceptions

Our research incorporated two key questions to gauge participants' entrepreneurial intentions and perceptions of selfemployment as a career path. The first question asked, "Are you planning on

launching a business in the future?" and the second inquired, "Do you consider selfemployment as a solution for your professional life?". Participants responded to these queries with a simple 'yes' or 'no'.

Measuring Entrepreneurial Competencies

We utilised the Entrepreneurial Potential Assessment Inventory (EPAI) developed by Santos, Caetano, and Curral (2013) to evaluate entrepreneurial competencies. This tool measures competencies identified in the literature as critical for predicting entrepreneurial success and performance, encompassing entrepreneurial motivation, social, management, and psychological competencies. The EPA defines entrepreneurial potential as a unique blend of competencies and motivations that prepare an individual for entrepreneurship (Santos et al., 2013). It was previously validated, making it an appropriate tool for assessing the entrepreneurial competencies of temporary workers.



Fig.1 Sample Descriptive Information of Transient Workers (N=184)

The assessment covered various dimensions of entrepreneurial competencies:

Entrepreneurial Motivation: Assessed four items on economic motivation and two on independence motivation.

Social Competencies: Measured by two items each on communication and persuasion capacity and the ability to develop social networks.

Management Competencies: Evaluated through three items on vision, four on resource gathering, two on leadership capacity, and two on entrepreneurial selfefficacy.

Psychological Competencies: Analysed using two items on innovation capacity, three on emotional intelligence, and four on resilience. Each item was rated on a five-point scale from 'completely disagree' to 'completely agree'.

Identifying Business Opportunities

Additionally, we queried participants on the number of business opportunities they had

Results

Entrepreneurial Aspirations and Career Perspectives

previously identified, asking, "How many feasible business opportunities have you thought about?". This question allowed participants to reflect on and quantify the business opportunities they had



considered, providing further insights into their entrepreneurial mindset and experience.

Fig 2 & 3: 2. Entrepreneurial Intention and Career Option. 3. Average Business Opportunities

The study's findings on entrepreneurial intentions and the inclination of participants to view entrepreneurship as a viable career path revealed that half of the participants expressed an intention to start a business. At the same time, 40% saw entrepreneurship as a potential professional avenue. A notable finding is a significant but negative correlation between the intention to launch a business and considering entrepreneurship as a career option (Chi-square = 25.11; p < 0.001, Lambda = 0.32, Pearson's R = -0.056). This suggests that not all individuals aspiring to start a business view entrepreneurship as a long-term career path and vice versa.

Identification of Business Opportunities

Participants with a positive outlook towards both entrepreneurial intention and considering it as a career choice had notably identified more business opportunities in the past compared to their counterparts. Specifically, those entrepreneurial intention with positive identified an average of 1.83 business opportunities, significantly higher than the 0.55 average for those with a negative intention (F(1,169) = 22.21, p < 0.001). Similarly, participants positively inclined towards entrepreneurship as a career option identified an average of 1.57 opportunities, compared to 0.99 for those with a negative inclination (F(2,181)=3.40, p < 0.05).

Entrepreneurial Competencies Analysis

An analysis of entrepreneurial competencies and the number of business opportunities previously identified is detailed in Table 2. The data includes mean values and standard deviations for each competency. The study found the lowest average score in independence motivation (M = 3.16) and highest in entrepreneurial self-efficacy (M = 4.10), indicating a range of strengths and areas for development among the participants regarding entrepreneurial competencies.

Discussion

In this study, the exploration focused on how temporary workers perceive their entrepreneurial competencies and their aspirations and readiness to embark on entrepreneurship. The initial analysis revealed a complex relationship between the intention to engage in entrepreneurial endeavours and the willingness to entrepreneurship as a career. While a significant association was found, not all participants who expressed a positive intention towards entrepreneurship were willing to follow through as entrepreneurs, and vice versa. This discrepancy among participants merited further exploration.

To understand these variations, a Multiple Correspondence Analysis (MCA) was conducted to categorise temporary workers based on their competencies, entrepreneurial intentions, and willingness to consider entrepreneurship as a viable career path. Four distinct profiles were identified:

1. Group 1: This group comprises temporary workers who intend to and are willing to embrace entrepreneurship as a career option. Notably, individuals in this group reported higher entrepreneurial levels of competencies, especially in terms of economic motivation. This aligns with findings from Brice & Nelson (2008) and Santos et al. (2013), suggesting those with greater entrepreneurial motivation often view selfemployment as more advantageous than traditional employment. In this group, positive intentions are entrepreneurial with elevated economic motivation and general proficiency in entrepreneurial competencies.

These findings contribute to a nuanced understanding of the entrepreneurial mindset among temporary workers, revealing that while some are inclined towards entrepreneurship, their competencies and motivations vary. This diversity underscores the need for tailored approaches to fostering entrepreneurship among temporary workers, considering their competencies and aspirations.

An intriguing revelation emerges from the data: a distinct group of temporary workers possesses positive entrepreneurial intentions but does not view entrepreneurship as a longterm career option (group 2). These individuals appear willing to participate in entrepreneurial activities, yet they do not perceive it as a lifelong pursuit, which aligns with the evolving concept of careers in the literature. In our interpretation, we view a career more as an occupational path than a lifelong commitment. Entrepreneurship represents another adaptable solution for these temporary workers rather than a career. They seem accustomed to confronting uncertainty and flexibly adapting to varying circumstances, reflecting their robust emotional intelligence and resilience. This aligns with the concept of entrepreneurial resilience defined in the literature (e.g., Friborg et al., 2006).

Members of this group view entrepreneurship as another step along their occupational path, something they may need to adjust to rather than a definitive solution for an unstable career. Notably, participants in this group exhibited a significantly higher ability to gather resources than those in other groups, a critical competency initiating entrepreneurial endeavours and navigating complex environments (e.g., Tan & Peng, 2003).

Conversely, individuals with harmful entrepreneurial intentions and no willingness to consider entrepreneurship as a career option displayed lower entrepreneurial competencies and motivations. This underscores the significance of cultivating entrepreneurial competencies. From these findings, it is plausible to suggest that these individuals may not perceive themselves as possessing the requisite competencies for engaging in entrepreneurial activities, viewing them as the next step in their occupational path instead.

This line of reasoning also aligns with the outcomes observed in group 4. An interesting pattern emerges in this segment of temporary workers, characterised by negative entrepreneurial intentions but a positive inclination to contemplate entrepreneurship as a career choice. Participants in this group express a belief that they possess competencies at a low or moderate level, a self-perception that influences their willingness not to engage in entrepreneurial activities.

It appears that these individuals, while hesitant to embark on entrepreneurial endeavours, would consider entrepreneurship as a viable career option if they believed they had the necessary competencies. Notably, these temporary workers perceive entrepreneurial competencies as falling within the moderate range, allowing them to regard entrepreneurship as a feasible path within their occupational journey. However, they may not yet feel fully prepared to undertake entrepreneurial immediately. activities

It is pertinent to consider that temporary workers often harbour negative perceptions of their labour situation (Kraemer et al., 2005). They grapple with precarious employment conditions and are acutely aware of the inherent instability within the contemporary labour landscape. Therefore, it becomes imperative to explore their willingness to entertain self-employment as a viable option, given the current work market conditions and evolving career paradigms.

However, our findings indicate that temporary workers do not unequivocally view entrepreneurship as a definitive career alternative, nor do they believe they possess all the requisite competencies to embrace it fully at this juncture.

Limitations and Directions for Future Research

While our study delved into the realms of entrepreneurial intentions and the willingness of temporary workers to consider entrepreneurship as a career choice, it is essential to note that these responses do not necessarily predict actual behaviour. Future research endeavours should aim to ascertain whether these temporary workers engage in entrepreneurial activities and genuinely envision this pursuit as a long-term career path. This would provide valuable insights into aligning intentions with actions among this demographic.

Furthermore, there are several avenues for expanding the scope of research in this domain. Firstly, considering additional competencies and exploring alternative career perspectives would be beneficial. For instance, Segal, Borgia, and Schoenfeld (2002) employed a social cognitive career theory to forecast self-employment aspirations among students. Incorporating such measures into future investigations involving temporary workers or individuals in precarious employment could offer fresh perspectives.

Additionally, alternative competency frameworks, such as the one proposed by Man et al. (2002), which emphasises the competitive advantage conferred by these competencies within specific organisational contexts, merit exploration in future research endeavours. This broader perspective on competencies could yield valuable insights into their relevance and applicability in various work settings.

The literature also engages in a debate regarding whether self-employment can be regarded as a form of entrepreneurship. Some scholars, such as Blanchflower, Oswald, and Stutzer (2001), view self-employment as the most basic form of entrepreneurship. In the context of temporary workers, it can be seen as a transitional option and an initial step towards more extensive entrepreneurial endeavours.

It is worth noting that while we explored the self-perceptions of temporary workers concerning their competencies and their views on entrepreneurship in their career paths, self-employment, like any form

of work, is not without its challenges. Patzelt and Shepherd (2011) have demonstrated that selfemployment can be associated with negative emotions. Nevertheless, our primary aim was to gain insights into how temporary workers perceive their competencies and the role of entrepreneurship in their occupational journeys.

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Classification of articles is a duty of the editorial staff and is of special importance. Referees and the members of the editorial staff, or section editors, can propose a category, but the editor-in-chief has the sole responsibility for their classification. Journal articles are classified as follows:

Scientific articles:

- 1. Original scientific paper (giving the previously unpublished results of the author's own research based on management methods).
- 2. Survey paper (giving an original, detailed and critical view of a research problem or an area to which the author has made a contribution visible through his self-citation);
- 3. Short or preliminary communication (original management paper of full format but of a smaller extent or of a preliminary character);
- 4. Scientific critique or forum (discussion on a particular scientific topic, based exclusively on management argumentation) and commentaries. Exceptionally, in particular areas, a scientific paper in the Journal can be in a form of a monograph or a critical edition of scientific data (historical, archival, lexicographic, bibliographic, data survey, etc.) which were unknown or hardly accessible for scientific research.

Professional articles:

- 1. Professional paper (contribution offering experience useful for improvement of professional practice but not necessarily based on scientific methods);
- 2. Informative contribution (editorial, commentary, etc.);
- 3. Review (of a book, software, case study, scientific event, etc.)

Language

The article should be in English. The grammar and style of the article should be of good quality. The systematized text should be without abbreviations (except standard ones). All measurements must be in SI units. The sequence of formulae is denoted in Arabic numerals in parentheses on the right-hand side.

Abstract and Summary

An abstract is a concise informative presentation of the article content for fast and accurate Evaluation of its relevance. It is both in the Editorial Office's and the author's best interest for an abstract to contain terms often used for indexing and article search. The abstract describes the purpose of the study and the methods, outlines the findings and state the conclusions. A 100- to 250-Word abstract should be placed between the title and the keywords with the body text to follow. Besides an abstract are advised to have a summary in English, at the end of the article, after the Reference list. The summary should be structured and long up to 1/10 of the article length (it is more extensive than the abstract).

Keywords

Keywords are terms or phrases showing adequately the article content for indexing and search purposes. They should be allocated heaving in mind widely accepted international sources (index, dictionary or thesaurus), such as the Web of Science keyword list for science in general. The higher their usage frequency is the better. Up to 10 keywords immediately follow the abstract and the summary, in respective languages.

Acknowledgements

The name and the number of the project or programmed within which the article was realized is given in a separate note at the bottom of the first page together with the name of the institution which financially supported the project or programmed.

Tables and Illustrations

All the captions should be in the original language as well as in English, together with the texts in illustrations if possible. Tables are typed in the same style as the text and are denoted by numerals at the top. Photographs and drawings, placed appropriately in the text, should be clear, precise and suitable for reproduction. Drawings should be created in Word or Corel.

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Citation in the text must be uniform. When citing references in the text, use the reference number set in square brackets from the Reference list at the end of the article.

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Footnotes are given at the bottom of the page with the text they refer to. They can contain less relevant details, additional explanations or used sources (e.g. scientific material, manuals). They cannot replace the cited literature.

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